

REMARKS

Claims 32-35 and 45-51 are pending and rejected. Claim 32 is amended without introducing new matter. Claim 52 is added without introducing new matter. Applicants respectfully request reconsideration for the following reasons.

CLAIM REJECTIONS UNDER 35 U.S.C. §112

Claims 32-35 and 45-51 are rejected under 35 U.S.C. §112 ¶1 as not enabled. The Examiner states "...the specification, while being enabling for some cyanine dyes does not reasonably provide enablement for all cyanine or indocyanine dyes."

Claims 32-35 and 45-51 are rejected under 35 U.S.C. §112 ¶2 as indefinite. The Examiner maintains the rejection "because based on what is known in the art about how cyanine and indocyanine dyes vary structurally, one of ordinary skill in the art would not be able to predict, without some undue experimentation, which cyanine and indocyanine species are compatible with the instant invention."

The Examiner states that, according to the Wikipedia encyclopedia, cyanine encompasses structurally distinct groups of compounds.

Applicants respectfully disagree, dispute the Examiner's Wikipedia encyclopedia cite, and reassert their February 26, 2009 arguments, which included an attachment providing the definition of "cyanine dye" from Hawley's Condensed Chemical Dictionary, 14th Ed., John Wiley and Sons, Inc., New York 2001. Such a dictionary cite is credible, not susceptible to unchecked information, and not easily vandalized. When Hawley's Chemical Dictionary is weighed against the Wikipedia cite, Hawley's Chemical Dictionary must take precedence.

On August 15, 2006, the U.S. Patent and Trademark Office instructed its examining corps that Wikipedia could not be cited as a source. John J. Doll, Commissioner for Patents, announced to *Business Week* that "The problem with Wikipedia is that it's constantly changing..." and "We've taken Wikipedia off our list of accepted sources of information." *Business Week*, Up Front, Sept. 4, 2006 (p. 2 of Exhibit A attached). To the best of the Applicant's knowledge, this policy is still in effect and Wikipedia is still not "an accepted source" within the Office. Thus, the Examiner's rejections over the Wikipedia article exceed the discretion granted to the Examiner by the Commissioner, and must be withdrawn.

The Office's decision to reject Wikipedia as an accepted source of information is well founded. Both administrative agencies and reviewing courts have noted that Wikipedia is not an authoritative source, and have found or otherwise commented that it is not sufficiently reliable to serve as a basis for official decisions. See *Badasa v. Mukasey*, 540 F.3d 909, 911 (8th Cir. 2008) (Exhibit B attached) (remanding immigration appeal because "we do not know whether the [immigration judge] would have reached the same conclusion without Wikipedia or whether (and, if so, why) the [Board of Immigration Appeals] believes that the [immigration judge]'s

consideration of Wikipedia was harmless error..."); *id.* at 910 ("[The Board of Immigration Appeals does] not condone or encourage the use of resources such as Wikipedia.com in reaching pivotal decisions in immigration proceedings" and "presumably was concerned that Wikipedia is not a sufficiently reliable source on which to rest the determination..."); *Campbell v. Sec'y of HHS*, 69 Fed. Cl. 775, 781 (Fed. Cl. 2006) (Exhibit C attached)) (information drawn from Wikipedia.com does not on its face meet the reliability requirement of *Daubert* and "[a] review of the Wikipedia website reveals a pervasive and, for our purposes, disturbing series of disclaimers."). Wikipedia is not a commercial product, a peer-reviewed publication, or a learned treatise – it is an omnibus compilation where "anyone can edit and we encourage you to **be bold!**" Wikipedia: Introduction (available at http://en.wikipedia.org/wiki/Welcome_to_Wikipedia) (emphasis in original).

Due to this nature, Wikipedia itself includes prominent disclaimers and caveats, acknowledging that:

Users should be aware that not all articles are of encyclopedic quality from the start: they may contain false or debatable information

...

Some articles contain statements which have not yet been fully cited

...

[I]t is important to use Wikipedia carefully if it is intended to be used as a research source, since individual articles will, by their nature, vary in quality and maturity.

...

Wikipedia's greatest strengths, weaknesses, and differences all arise because it is open to anyone, it has a large contributor base, and its articles are written by consensus

...

Allowing anyone to edit Wikipedia means that it is more easily vandalized or susceptible to unchecked information, which requires removal.

...

Verifiability, which explains that it must be possible for readers to verify all content against credible external sources (following the guidance in the Wikipedia:Risk disclaimer that is linked-to at the bottom of every article).

<http://en.Wikipedia.org/wiki/Wikipedia:About> (Exhibit D relevant pages attached)

Wikipedia's radical openness means that any given article may be, at any given moment, in a bad state: for example, it could be in the middle of a large edit or it could have been recently vandalized. While blatant vandalism is usually easily spotted and rapidly corrected, Wikipedia is certainly more subject to subtle

vandalism and deliberate factual errors than a typical reference work.

...

[Wikipedia] is also subject to remarkable oversights and omissions. There is no systematic process to make sure that "obviously important" topics are written about, so at any given time Wikipedia may be wildly out of balance in the relative attention paid to two different topics.

...

...Wikipedia articles... are liable to be incomplete in ways that would be unusual in a more tightly-controlled reference work.

...

Because this is an open wiki, there is no guarantee that a featured article retains its quality over time, and of course an older featured article does not magically improve as Wikipedia's standards generally rise.

Wikipedia: Researching with Wikipedia (available at http://en.wikipedia.org/wiki/Wikipedia:Researching_with_Wikipedia (Exhibit E relevant pages attached).

Wikipedia, because it relies upon uncompensated volunteer contributors, has gained notoriety for its error rate, compared to commercial reference works. See Rector, L.H., *Comparison of Wikipedia and other encyclopedias for accuracy, breadth, and depth in historical articles*, Reference Services Review, Vol. 36, No. 1, pp. 7-22 (2008) (Exhibit F attached; see p. 12: Wikipedia's accuracy rate was 80 percent compared with 95-96 percent accuracy within comparable articles in the Encyclopaedia Britannica, The Dictionary of American History, and American National Biography Online) (summary available at <http://www.emeraldinsight.com/10.1108/00907320810851998>). Simply put, Wikipedia is a source authored by the willing for reasons ranging from experimentation, to altruism, to naked self-interest, and cannot be considered to be a standard reference work reflecting the state of any field of research. See *Wired Magazine*, See Who's Editing Wikipedia - Diebold, the CIA, a Campaign, Aug. 14, 2007 (Exhibit G attached) (available at http://www.wired.com/politics/onlinerights/news/2007/08/wiki_tracker).

Anyone, including anonymous and/or pseudonymous contributors, can create and/or modify a Wikipedia article. Wikipedia thus cannot be presumed to be either authoritative or reliable, so as to constitute substantial evidence concerning the meaning of a claim term. See FoxNews.com, *Wikipedia Editor Out After False Credentials Revealed*, Mar. 8, 2007 (Exhibit H attached) (available at <http://www.foxnews.com/story/0,2933,257340,00.html>); USA Today.com, *A false Wikipedia 'biography'*, Nov. 29, 2005 (Exhibit I attached) (available at http://www.usatoday.com/news/opinion/editorials/2005-11-29-wikipedia-edit_x.htm). Unlike other sources, and particularly standard reference works routinely utilized by those in a pertinent field of

art, there is essentially no evidence that the substantive content of a Wikipedia article has been authored by, referred to, reviewed by, or accepted by, persons comparable to the hypothetical person of ordinary skill in the art. Further, although Wikipedia requires contributors to "cite reliable sources that are directly related to the topic of the article, and that directly support the information as it is presented," Wikipedia acknowledges that "many contributors do not cite their sources," and the Examiner has provided no evidence that the references in the citation are applicable. Consequently, the "Cyanine" Wikipedia article cannot serve, "to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application" as evidence of the ordinary and customary meaning of the term "cyanine". *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (*en banc*) (Exhibit J attached); *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004) (Exhibit K attached) ("customary meaning" refers to the "customary meaning in [the] art field"). A "constantly changing" Wikipedia article referenced in 2009 and authored by anonymous and/or pseudonymous contributors cannot reasonably and fairly be considered to trump the content of a long-established standard reference work routinely utilized by those working within the chemical arts. See Science Libraries @ Harvard, Research Guides, Getting Started in Chemistry Research (Exhibit L attached, available at <http://isites.harvard.edu/icb/icb.do?keyword=sciencelibraries&pageid=icb.page179250>).

The Examiner has failed to show that there remains a reasonable basis for maintaining the rejections from the prior Office Action, and has not established by a preponderance of the evidence that the rejections satisfy the standards of MPEP §§2164.01 and 2173.02. Accordingly, the present rejections are improper and must be withdrawn.

Applicants thus assert the rejections under 35 U.S.C. §112 ¶¶1 and 2 are overcome and respectfully request their withdrawal.

CLAIM REJECTIONS UNDER 35 U.S.C. §103

Claims 32-35 are rejected under 35 U.S.C. §103(a) as obvious over Licha U.S. Patent No. 6,083,485.

Applicants' amended claim 32 clarifies that the recited method is performed for, and results in, a composition in which fluorescence is enhanced when the composition is administered to a patient for a photodiagnostic or phototherapeutic procedure. The amendment is supported at least in originally filed claims 32-35, thus introducing no new matter. In contrast, Licha teaches adding cyclodextrin to improve stability and solubility. Applicants disagree that a person of ordinary skill in the art would find it obvious to use Applicants' method to enhance fluorescence, at least because Licha teaches away from Applicants' method. As one example of Licha's teaching away, Licha teaches the use of cyanine dyes as already solving the problem of insufficient fluorescence. As another example of Licha's teaching away, Licha teaches that fluorescence may not be desirable. For example, Licha states

The compounds used for the method according to the invention ..., where fluorescence is desirable, have a fluorescence quantum efficiency greater than 5%, are sufficiently water-soluble, tolerable and stable in vitro and in vivo as well as photostable. They are discharged as completely as possible in as short a time as possible. (col. 8 lines 31-38, emphasis)

and

Surprisingly, a fluoroscopic image of a mouse (Swiss nude) taken after applying a cyanine dye using a CCD camera showed a 1000 times greater fluorescent intensity as compared to a similarly dosed porphyrin. (col. 9 lines 25-28)

Based on these teachings of Licha, as well as Licha's teaching of enhanced stability and solubility, a person of ordinary skill in the art would not seek to further enhance fluorescence. Based on Licha, a person of ordinary skill in the art would be taught that cyanine alone already provides enhanced fluorescence. Based on Licha, a person of ordinary skill in the art would not be taught the specific concentration range recited in Applicants' claims to enhance fluorescence.

Applicants respectfully assert that, for at least these reasons, claims 32-25 are not obvious, and request the rejection be withdrawn.

CONCLUSION

Applicants believe the application is in complete condition for allowance. The fee to Request Continued Examination is being paid simultaneously by Electronic Funds Transfer. No other fees are believed due but, if deemed necessary, the Office is authorized to charge them to Deposit Account No. 20-0809.

Respectfully submitted,
THOMPSON HINE LLP

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SEPTEMBER 4, 2006

UP FRONT

Talk Show

"Quattrone was a very big fish, but the evidence against him was not very good." -- *John Fahy, a former federal prosecutor in New Jersey, on former investment banker Frank Quattrone's deal with prosecutors allowing him to avoid a third trial and return to business, as reported by Bloomberg News*

A Stock Soars On High Anxiety

Heavy demand for security technology drove American Science & Engineering (**ASEI**) to No. 12 on *BusinessWeek's* latest Hot Growth ranking of 100 small companies earlier this year (**BW -- June 5**). But on Aug. 9 the Billerica (Mass.) company announced disappointing earnings, and its stock fell 21%, to 36.30 a share.

Now AS&E's fortunes have changed again -- literally overnight. On Aug. 10, British authorities announced they had thwarted an alleged terrorist plot to blow up airplanes using explosives hidden in sports drinks. AS&E makes X-ray systems for screening cargo, vehicles, luggage, and even people. And unlike standard metal detectors used in airports, its system can spot liquids. It therefore could be used to nab anyone attempting to sneak them onto planes. The U.S. Homeland Security Dept.'s Transportation Security Administration is planning to test AS&E's people-screening systems in airports.

The company's stock flew to 47.20 on news of the terrorist plot, marking a full recovery from its earnings-related swoon. It could take several months for AS&E's top line to reflect the impact of all this. But, says Bob Postle, the company's vice-president for sales and marketing, "we've certainly had an increase in phone calls."

By Arlene Weintraub

Dear Ben, Feel Our Pain

With housing slumping dramatically, hopes for a soft landing in the sector could be evaporating. According to Goldman Sachs (**GS**), housing inventories are at their highest levels in more than a decade. Just how worried are homebuilders? A few weeks ago, on the eve of the Federal Reserve Board's Aug. 8 Open Market Committee meeting, the National Association of Homebuilders sent letters to Fed Chief Ben Bernanke and each of the other members of the interest-rate-setting committee. The message: Official stats don't capture how badly housing is hurting, since those figures don't include canceled contracts, which doubled over the past year. The letter also

EXHIBIT A

argued that inflation is more benign than feared, because one measure, rising rents, is overweighted in the consumer price index. NAHB Chief Economist David Seiders says this is the first time since he joined the staff, in 1984, that the group has written such a letter to the Fed.

Granted, such a move seems mild compared with the actions of the early 1980s, when, to protest double-digit interest rates, a desperate NAHB mailed lumber (two-by-fours, meant to symbolize unbuilt homes) to then Fed Chief Paul Volcker. And it's not known if the NAHB's recent letter influenced the bankers in the marble temple, who chose -- for the first time in two years -- not to raise rates at its August meeting. But, says Tom Schlesinger, director of the Financial Markets Center, a Fed watchdog group, the urgent communication is "certainly a symptom" of the current anxiety.

By Catherine Yang

"Shop In Thrift Stores" (Tip No. 39)

From "101 Ways to Save Money," sent by Northwest Airlines to a number of employees coping with steep pay cuts and layoffs as part of the airline's plan to emerge from Chapter 11.

- 8. Replace 100 watt bulbs with 60 watt.
- 15. Get hand-me-down clothes and toys for your kids from family and friends.
- 18. Take a shorter shower.
- 21. Make your own baby food.
- 34. Change the oil in your car yourself regularly.
- 46. Don't be shy about pulling something you like out of the trash.

Kicking Wiki Out Of The Patent Office

Patents are enduring, conferring rights on their owners for up to 20 years. Yet until about a week ago, scores of them may have been granted based partly on information that can be altered with a keystroke from anyone surfing the Web.

On Aug. 15, the U.S. Patent & Trademark Office yanked Wikipedia from the digital toolbox its examiners use to help determine a patent application's validity. But over the past several years, examiners used the online encyclopedia, which allows users to edit entries, to inform their decisions. Wikipedia has been cited in patent decisions on everything from car parts to chip designs.

"The problem with Wikipedia is that it's constantly changing," Patents Commissioner John Doll said. "We've taken Wikipedia off our list of accepted sources of information." An agency spokesperson said inquiries from *BusinessWeek* about the use of Wikipedia led to the policy shift.

Critics say the change is long overdue. "I've been complaining about this for years," says Greg Aharonian, publisher of a patent newsletter and a longtime agency gadfly. "From a legal point of view, a Wiki citation is toilet paper." Doll says the agency used Wikipedia entries as background and not as a basis for accepting or rejecting an application.

By Lorraine Woellert

Two-Minute Warning

The NFL almost fumbled this one. Less than a month before the start of the regular season on Sept. 7, it realized that its Wilson footballs, signed by retiring Commissioner Paul Tagliabue and still in production, were soon to be obsolete. It wasn't until Aug. 10, two days after Roger Goodell was named to the post, that Wilson Sporting Goods began to crank out Goodell-signed pigskins at its Ada (Ohio) plant, which will work overtime to make the 9,000 used in a season. Chris Considine, Wilson's president, says the factory lifted Goodell's signature from the contract he signed with Wilson as the NFL's COO. As for the 5,000 Tagliabue balls ready to go, the league will eat the costs (about \$250,000) and donate them to high schools.

By Tom Lowry

Musings Of An Adman

russelldavies.typepad.com/

WHY READ IT

Advertising account planners -- the folks who interpret customer research and make sure the creative types are lined up with client strategies -- can learn from a master, Russell Davies, who gives "homework" assignments on this blog. For those outside advertising, this former head of planning at Nike (**NKE**) and ad shop Wieden+Kennedy has something for everyone: snapshots of ads and images that inspire him, theories about brand authenticity, and, it must be said, some really cute pictures of his son, Arthur.

By Jena McGregor

"Uncle Sam Or Uncle Sucker?"

Stock up on red chili peppers and buy that granite countertop now: Chuck Grassley, Senate Finance Committee chief, wants to stop U.S. tariff breaks to India (chilies) and Brazil (a granite exporter). Grassley (R-Iowa), who blames the countries for stalling the recent Doha trade talks, says that unless the White House ends preferential treatment for the two nations, he will block renewal of the \$1 billion, 140-country program that makes some imports from developing nations duty free. "Are we Uncle Sam or Uncle Sucker?" he asks.

The U.S. Trade Representative's Office is reviewing the program, with comments due Sept. 5. It may get an earful about some unintended consequences of Grassley's plan. McCormick & Co. (**MKC**) gets 80% of its chili peppers from India, and U.S. jewelers sell India's diamond rings. Importers of auto parts from Brazil may be hit harder: It's tough to find suppliers of these highly engineered items, says the Motor & Equipment Manufacturers Assn.

By Catherine Yang

The Sweet Smell Of Excess

Perhaps the fragrance industry's next scent should be called Proliferation. Trying to hang on to market share as industry growth flattens, makers are introducing scent after scent. "It's a challenging and extremely competitive time," says Karen Grant, a senior beauty analyst at market research firm NPD Group. Last year a record 124 new perfumes and colognes hit U.S. department stores. That figure, which doesn't include "mass" fragrances sold at stores like CVS (**CVS**) and Target (**TGT**), tops the number of so-called

prestige scents launched during the 1970s and 1980s.

This year is expected to be even more prolific. About 200 prestige fragrances should be launched by yearend, including brands from celebrities (Derek Jeter's Driven, for instance), TV shows (*Desperate Housewives'* Forbidden Fruit), and clothing lines (Juicy Couture, from the fashion brand of the same name).

Grant says the profusion of scents started in 2002, in the post-9/11 economic downturn. Since then fragrance growth has been minimal, despite successes like Britney Spears's Curious, which racked up \$125 million in global sales in 2004 and 2005, according to Euromonitor. This year, Grant predicts, the almost \$3 billion prestige market will stay flat or rise just 1%.

The flood of products means that most scents have a shorter life cycle -- a year at most, vs. about three years in the past, says Micheline Jordaan, Divisional Merchandise Manager of Fragrance for Macy's (FD) East.

Bernd Beetz, CEO of COTY, however, appears to shrug off such worries. He compares the turnover to fashion's fast pace: "Are there too many fragrances on the market?" he says. "That's like asking, 'Do you ever have enough clothes?'"

By Elizabeth Woyke

Juicing Up The BlackBerry

Got your belt clip handy? Research In Motion (RIM) is preparing to launch the latest BlackBerry, the Pearl, that should appeal to more than just harried executives. In a revamp of its business model, the Waterloo (Ont.) company and wireless carrier T-Mobile will pitch the device to regular, gadget-loving consumers starting in mid-September. About the same size as Motorola's (MOT) popular Razr phone, the Pearl will have a built-in digital camera, Bluetooth wireless capability, and a memory-card expansion slot to handle music and video.

Now that even soccer moms are managing their lives by mobile e-mail and text messaging, wireless carriers have been pushing RIM to create more consumer-friendly products. And they seem to be happy with RIM's effort. Cingular Wireless is expected to add the BlackBerry Pearl to its lineup this fall. Other carriers are testing it, too.

RIM is jumping into a crowded market dominated by Nokia (NOK), Motorola, Samsung, and others -- but it has no choice. Since January, its market share of corporate e-mail activations slipped five percentage points, to 59%, in a market that's still growing, says researcher Strategy Analytics.

There is a risk that RIM's move will turn off its most important customers, corporations that treasure the BlackBerry because it is more secure than other wireless e-mail systems. That's precisely because RIM hasn't permitted expansion slots, cameras, and other popular features.

By Cliff Edwards and Roger O. Crockett

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Lamilem BADASA, Petitioner,

v.

Michael B. MUKASEY, Attorney
General of the United States,
Respondent.

No. 07-2276.

United States Court of Appeals,
Eighth Circuit.

Submitted: March 14, 2008.

Filed: Aug. 29, 2008.

Background: Alien petitioned for review of the decision of the Board of Immigration Appeals (BIA) denying her applications for asylum and relief under the Convention Against Torture (CAT).

Holding: The Court of Appeals, Colloton, Circuit Judge, held that BIA failed to adequately explain its conclusion that alien did not establish her identity.

Petition granted.

Aliens, Immigration, and Citizenship
⌘580

Board of Immigration Appeals (BIA) failed to adequately explain its conclusion that asylum applicant, who entered country illegally using fraudulent Italian passport, did not establish her identity; BIA acknowledged that it was improper for Immigration Judge (IJ) to consider information from free internet encyclopedia that anyone could edit in evaluating applicant's submission, but made no independent determination that applicant failed to establish her identity.

Sally Margaret Silk, argued, Minneapolis, MN, for petitioner.

Aliza Bessie Alyeshmerni, DOJ, argued, Nancy E. Friedman, DOJ, on the brief, Washington, DC, for respondent.

Before BYE, SMITH, and COLLOTON,
Circuit Judges.

COLLOTON, Circuit Judge.

Lamilem Badasa entered the country illegally using a fraudulent Italian passport. She later applied for asylum under 8 U.S.C. § 1158 and for relief under Article III of the Convention Against Torture. The Immigration Judge (IJ) found that Badasa had submitted fraudulent documents designed to establish her identity, and that her claim was not credible. The Board of Immigration Appeals (BIA) initially dismissed her administrative appeal, concluding that Badasa had failed to establish her identity. Badasa moved to reopen her case based on a travel document recently acquired from the Ethiopian government, known as a *laissez-passer*, which Badasa alleged would establish her identity. Noting that the Department of Homeland Security (DHS) concurred in the motion, the BIA reopened the case and remanded it to the IJ for further consideration.

On remand, the DHS submitted several documents designed to explain the purpose of a *laissez-passer*, and argued that the document did not establish identity and nationality, but rather was "simply the granting of the authorization for an alien to travel to or from that country." After considering evidence presented by the parties, including information submitted by the DHS from an Internet website known as Wikipedia, the IJ found that the *laissez-passer* is a single-use, one-way travel document that is issued based on information provided by the applicant. On this basis, the IJ concluded that the Ethiopian government's issuance of the travel document did not change her prior decision regarding Badasa's failure to prove her identity, and therefore denied the application for asylum.

The BIA dismissed Badasa's appeal, concluding that the IJ's determination that the *laissez-passer* travel document was insufficient to establish Badasa's identity was not clearly erroneous. The BIA stated that it did "not condone or encourage the use of resources such as Wikipedia.com in reaching pivotal decisions in immigration proceedings," and commented that the IJ's decision "may have appeared more solid had Wikipedia.com not been referenced." The BIA declined, however, to find that Badasa was prejudiced, because without considering Wikipedia, the BIA believed the IJ's conclusion "was supported by enough evidence to find no clear error."

We conclude that the case must be remanded for further proceedings, because the BIA failed adequately to explain its conclusion that Badasa did not establish her identity. See *SEC v. Chenery Corp.*, 318 U.S. 80, 94-95, 63 S.Ct. 454, 87 L.Ed. 626 (1943). The BIA did not adopt the entirety of the IJ's reasoning for rejecting Badasa's claim. Rather, the BIA acknowledged that it was improper for the IJ to consider information from Wikipedia in evaluating Badasa's submission on remand, and the government does not dispute that conclusion here. Wikipedia describes itself as "the free encyclopedia that anyone can edit," urges readers to "[f]ind something that can be improved, whether content, grammar or formatting, and make it better," and assures them that "[y]ou can't break Wikipedia," because "[a]nything can be fixed or improved later." Wikipedia: Introduction, <http://en.wikipedia.org/wiki/Wikipedia:Introduction> (last visited August 7, 2008). Wikipedia's own "overview" explains that "many articles start out by giving one—perhaps not particularly evenhanded—view of the subject, and it is after a long process of discussion, debate, and argument that they gradually take on a consensus form." Wikipedia: Researching with Wikipedia, http://en.wikipedia.org/wiki/Wikipedia:Researching_with_Wikipedia

(last visited August 7, 2008). Other articles, the site acknowledges, "may become caught up in a heavily unbalanced viewpoint and can take some time—months perhaps—to regain a better-balanced consensus." *Id.* As a consequence, Wikipedia observes, the website's "radical openness means that any given article may be, at any given moment, in a bad state: for example, it could be in the middle of a large edit or it could have been recently vandalized." *Id.* The BIA presumably was concerned that Wikipedia is not a sufficiently reliable source on which to rest the determination that an alien alleging a risk of future persecution is not entitled to asylum. See also *Campbell v. Sec'y of Health and Human Servs.*, 69 Fed.Cl. 775, 781 (Fed.Cl.2006) (observing that a review of the Wikipedia website "reveals a pervasive and, for our purposes, disturbing set of disclaimers"); R. Jason Richards, *Courting Wikipedia*, 44 Trial 62 (Apr.2008) ("Since when did a Web site that any Internet surfer can edit become an authoritative source by which law students could write passing papers, experts could provide credible testimony, lawyers could craft legal arguments, and judges could issue precedents?").

The BIA did say that Badasa was not prejudiced by the IJ's reliance on Wikipedia, but it made no independent determination that Badasa failed to establish her identity. Whereas the BIA sometimes applies a "harmless error" standard when an IJ considers improper evidence or makes other procedural error, see *Matter of Santos*, 19 I. & N. Dec. 105 (BIA 1984); *In re Samuel Cardona*, 2008 WL 1734684 (BIA 2008); *In re Juan Jose Flores-Amezcuca Eulalia Pereda*, 2004 WL 2943392 (BIA 2004), and thereby evaluates whether the error affected the IJ's ultimate conclusion, the BIA here determined only that there was sufficient evidence, other than Wikiped-

dia, to establish that the IJ's finding was not "clear error." This is the correct scope of review when an IJ has made findings of fact based on proper evidence, 8 C.F.R. § 1003.1(d)(3)(i), but application of the deferential "clear error" standard to this situation leaves us without a determination by the agency as to whether Badasa proved her identity. We know only that the BIA thinks that if, hypothetically, the IJ had not considered Wikipedia and reached the same conclusion, then that conclusion would not be clearly erroneous. But we do not know whether the IJ would have reached the same conclusion without Wikipedia, or whether (and, if so, why) the BIA believes that the IJ's consideration of Wikipedia was harmless error, in the sense that it did not influence the IJ's decision. Because the BIA's ultimate conclusion that Badasa failed to establish her identity is not adequately explained, we must remand for further proceedings. *See Shahinaj v. Gonzales*, 481 F.3d 1027, 1029 (8th Cir. 2007).

The petition for review is granted, and the case is remanded to the BIA.



STRAIGHTS AND GAYS FOR EQUALITY (SAGE); N.R. by Her Next Friend and Parent S.R.; H.W. by Her Next Friend and Parent M.W., Appellees,

v.

OSSEO AREA SCHOOLS—DISTRICT NO. 279; Larry A. McGee, Member & Chairperson of the School Board of Osseo Schools—District 279, in his individual and official capacities; Dean G. Henke, Member & Vice Chairperson of the School Board of Osseo Area Schools—District 279, in his individual and official capacities; John L.

Nelson, Member & Clerk of the School Board of Osseo Area Schools—District 279, in his individual and official capacities; Kim Green, Member & Treasurer of the School Board of Osseo Area Schools—District 279, in her individual and official capacities; Linda J. Etim, Member & Director of the School Board of Osseo Area Schools—District 279, in her individual and official capacities; Judith G. Peterzen, Member & Director of the School Board of Osseo Area Schools—District 279, in her individual and official capacities; John O'Sullivan, Jr., Superintendent of Osseo Area Schools—District 279, in his individual and official capacities; Wendy Loberg, Principal of Maple Grove Senior High School, in her individual and official capacities; Maple Grove Senior High School; Dr. James L. Smith, former Interim Superintendent of Osseo Area Schools—District 279, in his individual capacity, Appellants.

No. 07-3576.

United States Court of Appeals,
Eighth Circuit.

Submitted: June 9, 2008.

Filed: Aug. 29, 2008.

Background: Student organization and two members brought civil rights action under § 1983 against school district, high school, and various school board members and school staff, alleging that defendants' refusal to allow organization the same access to school facilities and avenues of communication provided to other student groups violated the Equal Access Act (EAA). The United States District Court for the District of Minnesota, Joan N. Erickson, J., 2007 WL 2885810, granted partial summary judgment in favor of plaintiffs, and defendants appealed.

have been awarded the BPA even if the Contracting Officer had used the pricing analysis advocated by the plaintiff.

CONCLUSION

For the reasons stated, the court vacates and sets aside the DOL Contracting Officer's Determination & Findings dated December 9, 2005, disqualifying Systems Plus from competing in any corrected competition that might be ordered in this case. That disqualification decision was arbitrary, capricious, and contrary to law. The court GRANTS Systems Plus's motion for judgment on this issue and correspondingly DENIES the government's and NetStar's motions to dismiss.

In other respects, however, the court concludes that the errors identified in DOL's procurement did not prejudice Systems Plus's position in the procurement. Systems Plus's motion for judgment upon the administrative record of the procurement is accordingly DENIED. The government's and NetStar's cross-motions for judgment upon the administrative record regarding the procurement are GRANTED.

The Clerk is directed to enter judgment for plaintiff insofar as the Contracting Officer's disqualification decision is concerned. The judgment shall provide that the Contracting Officer's Determination & Findings dated December 9, 2005, are vacated and set aside. As to the procurement, the Clerk is directed to enter judgment for defendant and intervening defendant. The award of a BPA to NetStar shall not be disturbed. No costs.¹⁰

Because this decision might have contained "confidential or proprietary information" within the meaning of RCFC Appendix C, ¶ 4, it was initially issued under seal. The

10. Procedural motions pending before the court are resolved as follows: (1) Intervenor NetStar's motion to supplement the administrative record with the Contracting Officer's Determination & Findings is GRANTED IN PART. The court has considered the Contracting Officer's disqualification decision for jurisdictional purposes. (2) The government's motion to supplement the administrative record with three documents containing pre-bidding information is GRANTED. (3) System Plus's motions to supplement the administrative record with a declaration of its president and with materials that relate to the Contracting

parties were requested to review the decision and to file proposed redactions on or before February 27, 2006.

IT IS SO ORDERED.



Taylor Marie CAMPBELL, a minor, by her parents and natural guardians, Lee and Mandy CAMPBELL, Petitioners,

v.

SECRETARY OF HEALTH AND
HUMAN SERVICES,
Respondent.

No. 02-554 V.

United States Court of Federal Claims.

Filed under seal: Jan. 27, 2006.

Reissued: Feb. 14, 2006¹.

Background: Parents filed petition for compensation under the National Childhood Vaccine Injury Act, alleging that their minor daughter suffered a seizure disorder caused by the acellular DPT vaccine. The special master denied the petition, and petitioners filed motion for review.

Holding: The Court of Federal Claims, Allegra, J., held that special master was arbitrary and capricious in declining to hold an evidentiary hearing.

Motion granted; vacated and remanded.

Officer's disqualification decision are GRANTED IN PART. The court has considered these documentary materials because they relate to, and are properly considered regarding, prejudice and equitable issues, and the court's jurisdiction.

1. An unredacted version of this opinion was issued under seal on January 27, 2006. The parties were given an opportunity to propose redactions, but no such proposals were made. Accordingly, the opinion is issued in its original form, with minor corrections.

1. Federal Courts ¶1117

Under procedural rule of the Court of Federal Claims for vaccine injury cases that requires that each party in a vaccine injury case have a full and fair opportunity to present its case, the special master must ensure that, even without an evidentiary hearing, a record is created which is sufficient to allow review of the ultimate decision on compensation. RCFC App. B, Rule 3(b), 28 U.S.C.A.

2. Federal Courts ¶1117

A special's master's decision to deny an evidentiary hearing in a vaccine injury case is subject to arbitrary and capricious review.

3. Federal Courts ¶1116.1

Procedural rules of the Court of Federal Claims for vaccine injury cases, and the principles of fairness that underlie them, counsel in favor of holding an evidentiary hearing in a vaccine injury case where testimony reasonably might shed light on the apparent tension between medical records and later recorded recollections, particularly where there are ambiguities or lacunae in the former. RCFC App. B, Rules 3(b), 8(c), 28 U.S.C.A.

4. Federal Courts ¶1116.1

Special master in vaccine injury case was arbitrary and capricious in declining to hold an evidentiary hearing while concomitantly rejecting two affidavits by one of the petitioners, as well as two reports of petitioners' medical expert, essentially on weak credibility grounds, and adding, *sua sponte*, to the record, three weeks before her decision, a number of articles taken from the Internet without providing petitioners an adequate opportunity to respond to those documents.

Clifford J. Shoemaker, Shoemaker & Associates, Vienna, Virginia, for petitioner.

Melonie J. McCall, Torts Branch, Civil Division, U.S. Department of Justice, Washington, D.C., for respondent, with whom was Assistant Attorney General Peter D. Keisler.

OPINION

ALLEGRA, Judge.

Taylor Marie Campbell and her parents seek review of a decision rejecting their vaccine injury claims under the National Childhood Vaccine Injury Act of 1986, as amended, 42 U.S.C. §§ 300aa-10 *et seq.* (the Vaccine Act). Because the court concludes that the procedures employed by the Special Master were fundamentally unfair, and that her rulings are either inadequately explained or arbitrary and capricious, it remands this matter for further proceedings.

I. Background

The facts necessary to this ruling relate primarily to the procedures employed below and briefly are stated as follows:

On May 28, 2002, petitioners filed a petition pursuant to the Vaccine Act, alleging that Taylor Campbell suffered a seizure disorder beginning on Monday, May 31, 1999, caused by the acellular DPT vaccine. On August 29, 2003, petitioners submitted an expert report by neurologist Carlo Tornatore of the Georgetown University Hospital. On June 4, 2004, petitioners submitted a supplemental expert report from Dr. Tornatore, as well as a copy of his curriculum vitae. On July 7, 2004, the Special Master ordered petitioners to continue efforts to procure an expanded expert report from Dr. Tornatore and to submit an updated affidavit from the parents. On July 26, 2004, the Special Master ordered petitioners to submit an expanded expert report by August 17, 2004. No further expert reports were submitted. However, on August 27, 2004, petitioners filed supplemental medical literature in support of Dr. Tornatore's report. On November 1, 2004, respondent filed the report of its expert, neurologist Bennett L. Lavenstein, M.D., along with a copy of his curriculum vitae. On December 22, 2004, the case was assigned to a new special master.

On June 9, 2005, the Special Master issued an order scheduling a status conference on June 15, 2005, and, *sua sponte*, filed a preliminary ruling listing certain key facts to which she attached, as exhibits, nine articles relating to seizure disorders and fevers.

Those exhibits neither had been submitted nor validated by either of the parties or their experts, but apparently had been found by the Special Master while exploring the Internet. On June 15, 2005, an unrecorded status conference was held at which the Special Master reputedly indicated her intention to dismiss the case if petitioners were unable to produce any records indicating that Taylor had a fever with her seizures.² Petitioners had already filed a complete medical record and at least two affidavits by Taylor's mother in which she stated that Taylor had experienced febrile seizures, but they did not have any further records to support their claim. Accordingly, they did not file any further exhibits.

On June 30, 2005, the Special Master issued a decision denying petitioners' claim. Although the Special Master had not conducted an evidentiary hearing, she found the affidavits by Taylor's mother "not credible." The Special Master noted that the affidavits were not supported by the medical records, which recited that Taylor had a fever after receiving the vaccine, but did not note that she had a fever on the day the seizures began. Although recognizing that Taylor's mother had been traumatized by the seizures—the record includes a videotape of Taylor's mother weeping over her seizing child on June 1, 1999—the Special Master, nonetheless, took the view that had the mother observed a fever when the seizures occurred on May 31, she would have indicated this to the medical personnel and the records would have so reflected. And the Special Master reached this conclusion—again without a hearing—even though the contemporaneous medical records from the clinic and hospital to which Taylor was brought do not agree as to the date that the fever occurred (two reports indicate a fever on May 29, 1999, one places the fever "about" May 30, 1999, and yet another indicates a fever on June 1, 1999).

2. Defendant's counsel makes various allegations regarding what was said at this conference. But, petitioner's counsel has a different recollection of the hearing. Absent a transcript or some other written record, the court is ill-positioned to resolve this dispute. See *Johnston v. IVAC Corp.*, 885 F.2d 1574, 1581 (Fed.Cir.1989) (attorney

The Special Master also rejected the expert reports filed by Dr. Tornatore. She did so primarily, if not exclusively, because Dr. Tornatore had indicated that Taylor developed a febrile syndrome "concurrent with" the onset of her convulsions. Citing an online dictionary, the Special Master concluded that the medical records demonstrated that Dr. Tornatore's statement about the "'concurrency' of fever and seizures was erroneous." The Special Master did not mention, let alone discuss, Dr. Tornatore's second theory for a causation mechanism—direct toxicity to the nervous system from components of the vaccine, a theory that did not depend upon the presence of a fever. In her decision, the Special Master next strung together citations to a series of six cases in which she had rejected the claims that either whole cell or acellular DPT causes afebrile seizures—however, she did not comment on the extent to which the facts in those cases paralleled those herein and, in particular, did not discuss whether, in any of those cases, a fever occurred near the onset of seizures. Based upon these various findings, the Special Master concluded that "[p]etitioners have not presented a credible prima facie case that DPaT caused Taylor's seizures." On August 1, 2005, petitioners filed their Motion for Review.

II. DISCUSSION

Under the Vaccine Act, special masters are charged to make vaccine proceedings expeditious, flexible, and less adversarial, but not at the expense of providing each party a "full and fair opportunity to present its case and creating a record sufficient to allow review of the special master's decision." 42 U.S.C. § 300aa-12(d)(3)(B)(iii), (v), Vaccine Rule 3(b); *Hovey v. Sec'y of Health and Human Servs.*, 38 Fed.Cl. 397, 400-01 (1997). Vaccine Rule 8(c) emphasizes that "[i]n receiving evidence, the special master will not be bound by common law or statutory rules of

argument no substitute for evidence); *In re Budge Mfg. Co.*, 857 F.2d 773, 776 (Fed.Cir.1988) (statements of attorney are "no evidence"); see also *Sica v. United States*, 325 F.2d 831, 839 (9th Cir.1963) (reviewing court would not take cognizance of unreported statements allegedly attributed to trial judge).

evidence," but rather "will consider all relevant and reliable evidence, governed by principles of fundamental fairness to both parties." Although it has been held that this "fundamental fairness" concept does not incorporate the rigors of the Federal Rules of Evidence, see *Hines v. Sec'y of Health and Human Servs.*, 940 F.2d 1518, 1525-26 (Fed. Cir.1991), it plainly "requires a search for the truth," *Horner v. Sec'y of Health and Human Servs.*, 35 Fed.Cl. 23, 27 (1996). Moreover, consistent with due process, this fairness surely entails notice and an effective opportunity to be heard at a meaningful time and in a meaningful manner.³

When deciding a motion for review of a special master's decision, the court may:

- (A) uphold the findings of fact and conclusions of law of the special master and sustain the special master's decision,
- (B) set aside any findings of fact or conclusion of law of the special master found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law and issue its own findings of fact and conclusions of law, or
- (C) remand the petition to the special master for further action in accordance with the court's direction.

42 U.S.C. § 300aa-12(e)(2) (2000). Burnishing and combining these standards, the Federal Circuit has stated that this court "may set aside the decision of a special master only if the special master's fact findings are arbitrary and capricious, its legal conclusions are not in accordance with law, or its discretionary rulings are an abuse of discretion." *Turner v. Sec'y of Health & Human Servs.*, 268 F.3d 1334, 1337 (Fed.Cir.2001) (citing 42 U.S.C. § 300aa-12(e)(2)(B); *Munn v. Sec'y of Health and Human Servs.*, 970 F.2d 863, 870 n. 10 (Fed.Cir.1992)); see also *Saunders v.*

Sec'y of Health & Human Servs., 25 F.3d 1031, 1033 (Fed.Cir.1994); *Hart v. Sec'y of Health and Human Servs.*, 60 Fed.Cl. 598, 604 (2004). The last of these standards requires the court to "consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment." *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402, 416, 91 S.Ct. 814, 28 L.Ed.2d 136 (1971).⁴

[1, 2] Petitioners assault the Special Master's decision on various fronts, but their primary thrust involves her failure to grant them an evidentiary hearing. Respondent is quick to point out that the Vaccine Rules afford the special master discretion in choosing whether to hold a hearing, as they state that he or she "may decide a case on the basis of written filings without an evidentiary hearing." Vaccine Rule 8(d); see also *Plummer v. Sec'y of Health and Human Servs.*, 24 Cl.Ct. 304, 307 (1991). But, behind this discretion are concepts that limit and control. The discretion offered by Rule 8(d), for example, "is tempered by Vaccine Rule 3(b) which requires that each party have a full and fair opportunity to present its case." *Hovey*, 38 Fed.Cl. at 400-01. Under the latter rule, the special master also must ensure that, even without a hearing, a record is created which is sufficient to allow review of the ultimate decision on compensation. See *Hovey*, 38 Fed.Cl. at 401; *Dickerson v. Sec'y of Health and Human Servs.*, 35 Fed.Cl. 593, 598 (1996); *Murphy v. Sec'y of Health and Human Servs.*, 23 Cl.Ct. 726, 730, *aff'd*, 968 F.2d 1226 (Fed.Cir.1992), *cert. denied*, 506 U.S. 974, 113 S.Ct. 463, 121 L.Ed.2d 371 (1992). And a special's master's decision to deny a hearing is still subject to arbitrary and capricious review. See *Hovey*, 38 Fed. Cl. at 401; see also *Burns v. Sec'y of Health and Human Servs.*, 3 F.3d 415, 417 (Fed.Cir.

3. See, e.g., *Cleveland Bd. of Educ. v. Loudermill*, 470 U.S. 532, 542, 105 S.Ct. 1487, 84 L.Ed.2d 494 (1985) (stating that notice and an opportunity to be heard together comprise an "essential principle of due process"); *Mathews v. Eldridge*, 424 U.S. 319, 333, 96 S.Ct. 893, 47 L.Ed.2d 18 (1976); *Armstrong v. Manzo*, 380 U.S. 545, 552, 85 S.Ct. 1187, 14 L.Ed.2d 62 (1965) (A fundamental requirement of due process is the opportunity to be heard "at a meaningful time and in a meaningful manner."); see also *Doty v. United States*, 53 F.3d 1244, 1251 (Fed.Cir.1995)

("When procedural violations committed by the agency are egregiously removed from fairness, this constitutes an abuse of the agency's administrative discretion.").

4. See also *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 105-06, 103 S.Ct. 2246, 76 L.Ed.2d 437 (1983); *Advanced Data Concepts, Inc. v. United States*, 216 F.3d 1054, 1057-58 (Fed.Cir.2000).

1993). Although that review is deferential, the Supreme Court has cautioned that a court applying the arbitrary and capricious standard cannot permit itself to "slip into a judicial inertia" or mechanistically "rubber-stamp" the prior decision. *Bureau of Alcohol, Tobacco & Firearms v. Fed. Labor Relations Auth.*, 464 U.S. 89, 97, 104 S.Ct. 439, 78 L.Ed.2d 195 (1983) (quotations omitted); see also *Demutiis v. United States*, 48 Fed.Cl. 81, 87 (2000), *aff'd, as modified*, 291 F.3d 1373 (Fed.Cir.2002).

Petitioners allege that the Special Master abused her discretion in declining to hold an evidentiary hearing while concomitantly: (i) rejecting two affidavits by Taylor's mother, as well as Dr. Tornatore's two reports, essentially on weak credibility grounds; and (ii) adding, *sua sponte*, to the record, three weeks before her decision, a number of articles taken from the Internet without providing petitioners an adequate opportunity to respond to those documents. They also assert that because such an evidentiary hearing was not held, a record does not exist sufficient to review the Special Master's decision. Petitioners ultimately contend that they were prevented from having a full and fair opportunity to present their case in violation of Vaccine Rule 3(b).

Petitioners are right—a conclusion that becomes inescapable if one reviews the Special Master's failure to conduct an evidentiary hearing in light of the other actions she took.

To begin with, there are the various credibility findings that the Special Master rendered regarding the petitioners' affidavits and reports, based upon their alleged conflict with the earlier medical records. It is, of course, true that where later testimony conflicts with earlier contemporaneous documents, courts generally give the contemporaneous documentation more weight. See *United States v. United States Gypsum Co.*, 333 U.S. 364, 395–96, 68 S.Ct. 525, 92 L.Ed. 746 (1948); *Montgomery Coca-Cola Bottling Co. v. United States*, 222 Ct.Cl. 356, 615 F.2d 1318, 1328 (1980). And this principle has

been applied in the context of the Vaccine Program. See *Cucuras v. Sec'y of Health and Human Servs.*, 993 F.2d 1525, 1528 (Fed.Cir.1993) ("oral testimony in conflict with contemporary documentary evidence deserves little weight"). But, like any norm based upon common sense and experience, this rule should not be treated as an absolute and must yield where the factual predicates for its application are weak or lacking. As this court has aptly observed—

The rule should not be applied blindly Written records which are, themselves, inconsistent, should be accorded less deference than those which are internally consistent. Records which are incomplete may be entitled to less weight than records which are complete. If a record was prepared by a disinterested person who later acknowledged that the entry was incorrect in some respect, the later correction must be taken into account. Further, it must be recognized that the absence of a reference to a condition or circumstance is much less significant than a reference which negates the existence of the condition or circumstance.

Murphy, 23 Cl.Ct. at 733; see also *Camery v. Sec'y of Health and Human Servs.*, 42 Fed. Cl. 381, 391 (1998) (this rule "should not be applied inflexibly, because medical records may be incomplete or inaccurate").⁵ As these cases suggest, there are, at times, reasons why medical records do not accurately reflect all the symptoms a given patient was experiencing at a particular time—in the case of a young child, a given observation may have been overlooked by the caregiver, particularly under traumatic circumstances, or that symptom may have been relayed, but misreported or not recorded by the medical professional.

[3] Given the need to explore such possibilities, Vaccine Rules 3(b) and 8(c), and the principles of fairness that underlie them, counsel in favor of holding an evidentiary hearing where testimony reasonably might shed light on the apparent tension between

5. See also *Ale v. Tenn. Valley Auth.*, 269 F.3d 680, 689 (6th Cir.2001) (*U.S. Gypsum* rule inapplicable where documentary evidence was not "unambiguous," but rather "vague"); *Riddell v.*

Guggenheim, 281 F.2d 836, 840 (9th Cir.1960) (same where documentary evidence was "equivocal").

medical records and later recorded recollections, particularly where there are ambiguities or lacunae in the former. Applying these rules in this fashion effectuates "the system created by Congress, in which close calls regarding causation are resolved in favor of injured claimants." *Althen v. Sec'y of Health & Human Servs.*, 418 F.3d 1274, 1280 (Fed.Cir.2005); see also H.R.Rep. No. 99-908, at 3 (1986); *Knudsen v. Sec'y of Health and Human Servs.*, 35 F.3d 543, 549 (Fed. Cir.1994). It also implements Congress's desire that special masters "be vigorous and diligent in investigating factual elements necessary to determine the validity of the petitioner's claim." H.R.Rep. No. 99-908, at 17. Care must be taken lest evidentiary presumptions—even if, and perhaps because, they are commonly-invoked—short-circuit this system. Indeed, it is easy to carry such presumptions too far: it is one thing, for example, to apply the principle favoring contemporaneous records in assigning weight to oral testimony actually given (or, as in *U.S. Gypsum*, in reviewing fact findings based upon such testimony) and, quite another, to apply the same rule prophylactically, to prevent such oral testimony from being introduced in the first place. The latter ought to occur rarely and only where the contemporaneous records are so clear as to make it highly unlikely that an evidentiary hearing would alter a finding. See *Hale v. Sec'y of Health and Human Services*, 22 Cl.Ct. 403, 408 (1991) ("When all material facts are developed in the motion papers, a full trial is useless. 'Useless' in this context means that more evidence than is already available in connection with [the motion] could not reasonably be expected to change the result.").

[4] That is not the case here. The Special Master made short shrift of the affidavits of Taylor's mother even though the various medical records here disagree on basic facts, such as when Taylor had her fever(s) in relation to her seizures. No doubt, some of this confusion is attributable to the fact that the records list her DPT vaccination as occurring on different days, even though the parties agree it was administered on May 27, 1999. Indeed, in referring to the fever, the records use qualifiers like "about two days ago" or "no obvious fever noted at the time,"

leaving open the possibility that Taylor had a fever at the time she had at least one of her initial seizures. Yet, despite their fuzziness, the Special Master wielded these records as if they were crystal clear. She did so not only in discrediting Mrs. Taylor, but also in rejecting Dr. Tornatore's expert reports. In the latter instance, she viewed the medical records as flatly contradicting Dr. Tornatore's statement that Taylor had a fever "concurrent" with her seizure—going so far as to reject both of the doctor's causation theories, even though the second, involving the vaccine's direct toxicity to Taylor's nervous system, was in no way dependent upon the presence of a fever. In so concluding, the Special Master assumed that Dr. Tornatore meant that the fever occurred "at the same time" as the seizure, citing the primary definition of "concurrent" drawn from the website www.dictionary.com. Yet, it is perfectly possible that Dr. Tornatore instead intended to employ the second definition of the term "concurrent" listed on that same website, *to wit*, that the fever was "operating or acting in conjunction with" the seizure. *Id.*; see also *The American Heritage Dictionary of the English Language* 383 (4th ed.2000) ("concurrent: . . . 2. Operating or acting in conjunction with another"). Such an observation would not be inconsistent with the medical records. But, because she did not conduct a hearing, the Special Master neither explored this possibility, nor that some medical experts might view a seizure occurring shortly after a fever to be "febrile," rather than "nonfebrile." In so acting, the Special Master, in the court's view, violated not only the principles of fairness embodied in Vaccine Rule 8(c), but also the specific dictates of Vaccine Rule 3(b), which ensured petitioners a full and fair opportunity to present their case.

Further indication that the Special Master's failure to conduct an evidentiary hearing was arbitrary and capricious may be found in the medical "articles" on afebrile seizures that she *sua sponte* introduced into the record shortly before rendering her decision. The critical question here is—were these articles reliable? Although the Federal Circuit's recent decision in *Althen*, 418

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F.3d at 1278–81, makes clear that causation in vaccine cases need not be proven by peer-reviewed literature, that decision did not toss out reliability considerations altogether. See *Walther v. Sec'y of Health and Human Servs.*, 69 Fed.Cl. 123, 126–27 (2005). To the contrary, *Althen*, as well as prior Federal Circuit decisions, teach that the logical sequence of cause and effect showing that the vaccine was responsible for an injury must be supported by a “reputable medical or scientific explanation.” *Althen*, 418 F.3d at 1278; see also *Knudsen*, 35 F.3d at 548 (“sound and reliable medical or scientific explanation”); *Grant v. Sec'y of Health & Human Servs.*, 956 F.2d 1144, 1148 (Fed.Cir.1992) (*per curiam*). Logically, this standard requires a special master to rely on reliable medical or scientific evidence not only in finding causation, but also the lack thereof. See *Hart*, 60 Fed.Cl. at 608–09; see also Vaccine Rule 8(c) (requiring the special master to consider “all relevant, reliable evidence”). Indeed, this must be the case, if for no other reason, because the special master can rely only upon reliable evidence in performing the “gatekeeping” function required by *Daubert v. Merrell Dow Pharm., Inc.*, 509 U.S. 579, 597, 113 S.Ct. 2786, 125 L.Ed.2d 469 (1993), which the Federal Circuit has held generally applies in vaccine cases. See *Terran v. Sec'y of Health & Human Servs.*, 195 F.3d 1302, 1316 (Fed.Cir.1999); see also *Ryman v. Sec'y of Health and Human Servs.*, 65 Fed.Cl. 35, 40 (2005).

The articles that the Special Master culled from the Internet do not—at least on their face—remotely meet this reliability requirement. Consider the item on “febrile seizures” that she added from the Dictionary of Neurology, www.explore-medicine.com. Although that website no longer exists, the exhibit introduced by the Special Master indicates that its information was drawn from Wikipedia.com, a website that allows virtually anyone to upload an article into what is essentially a free, online encyclopedia. A review of the Wikipedia website reveals a pervasive and, for our purposes, disturbing series of disclaimers, among them, that: (i)

any given Wikipedia article “may be, at any given moment, in a bad state: for example it could be in the middle of a large edit or it could have been recently vandalized;” (ii) Wikipedia articles are “also subject to remarkable oversights and omissions;” (iii) “Wikipedia articles (or series of related articles) are liable to be incomplete in ways that would be less usual in a more tightly controlled reference work;” (iv) “[a]nother problem with a lot of content on Wikipedia is that many contributors do not cite their sources, something that makes it hard for the reader to judge the credibility of what is written;” and (v) “many articles commence their lives as partisan drafts” and may be “caught up in a heavily unbalanced viewpoint.” The websites from which other articles introduced by the Special Master are drawn likewise warn that “[t]he information provided herein should not be used . . . for the diagnosis or treatment of any medical condition,” www.iowahealth.org; that the sponsor “does not recommend or endorse any specific . . . opinions, or other information that may be mentioned on the Site,” www.webmd.com; or “makes no representation or warranty regarding the accuracy, reliability, completeness, currentness, or timeliness of the content, text or graphics” in its articles, www.nlm.nih.gov/medlineplus. And several of these websites caution that reliance on any information provided by the website is “solely at your risk,” see, e.g., www.webmd.com.

Of course, here the Special Master relied on these materials not at her risk, but at *petitioners'* risk. At the least, an evidentiary hearing would have provided an opportunity for expert witnesses to corroborate or refute the information contained in the articles. Without such a hearing, reliance on these web materials involved an extraordinary risk that cannot be squared with the Special Master's responsibility for conducting a proceeding consistent with the principles of fundamental fairness.⁶ And the notion, repeatedly pressed by respondent, that those risks somehow were diminished because the Special Master purportedly allowed the peti-

6. The situation here is far removed from that in *Hines*, 940 F.2d at 1525–26, where a special master's reliance on a single medical textbook

(the authoritative of which was unchallenged) was deemed permissible under the Vaccine Rules.

tioners 21 days within which to contest the articles has a decidedly hollow ring for at least three reasons. First, it is unclear whether the Special Master actually offered this opportunity—there is no record of this beyond the self-serving assertions of respondent's counsel, which petitioner's counsel flatly contests. Second, even if, as alleged, the Special Master made this offer at the status conference held on June 15, 2005, that was only fifteen days before her decision.⁷ Finally, even if one assumes that petitioners were given 21 days to respond to the articles, there is no indication whatsoever that their expert could have considered those sources and responded adequately in writing soon enough to forestall the Special Master from issuing her June 30, 2005, decision. Accordingly, the court finds patently unfair not only the Special Master's initial reliance on the articles in question, but also the half steps she purportedly took after introducing those articles into the record.

In truth, the court does not know to what extent the Special Master actually relied upon these articles, nor what procedures she actually offered petitioners—the former because her decision does not discuss the articles and the latter, again, because the critical conference was unrecorded. These omissions, in themselves, do not square with the Special Master's obligation to provide this court with a record that permits effective

judicial review. Quite the contrary. In fact, the Special Master's June 30, 2005, decision speaks repeatedly in a shorthand that is question-begging and far too cryptic to permit effective review. A classic example of this is the lengthy string cite that was employed for the proposition that "[t]he undersigned has never accepted that either whole cell or acellular DPT causes afebrile seizures." The decision does not explain how these six cases resemble the case *sub judice*. In several of them, the Special Master denied compensation even though the seizures were accompanied by a fever, leaving one to speculate as to what types of symptoms the Special Master believes must accompany a seizure in order to support a finding of compensation.⁸ And this is only one of several counts on which the court is left guessing. As such, the written decision here falls short of what is required to permit effective review, itself providing grounds for remand, but also providing further indication as to why the failure to conduct an evidentiary hearing here constituted an abuse of discretion. See *Dickerson*, 35 Fed.Cl. at 601 (failure to articulate specific findings constitutes error; "[d]ismissal without a hearing in this circumstance rises to the level of arbitrary and capricious action"); see also *McClendon v. Sec'y of Health and Human Servs.*, 23 Cl.Ct. 191, 196 (1991).⁹

7. Indeed, the articles in question were attached to a June 9, 2005, order, in which the Special Master rendered preliminary fact findings adverse to the petitioners, certainly giving petitioners the impression that, at the least, they faced an uphill battle in attempting to rebut those articles.

8. See *Bruesewitz v. Sec'y of Health and Human Servs.*, 2002 WL 31965744 (Fed.Cl.Spec.Mstr. Dec. 20, 2002); *Clements v. Sec'y of Health and Human Servs.*, 1998 WL 481881 (Fed.Cl. Spec.Mstr. July 30, 1998); *O'Connell v. Sec'y of Health and Human Servs.*, 1998 WL 64185 (Fed.Cl. Feb. 2, 1998), motion for review denied, 40 Fed.Cl. 891 (1998), *aff'd*, 217 F.3d 857 (Fed.Cir. 1999), cert. denied, sub. nom., *O'Connell v. Shalala*, 531 U.S. 812, 121 S.Ct. 45, 148 L.Ed.2d 15 (2000); *Haim v. Sec'y of Health and Human Servs.*, 1993 WL 346392 (Fed.Cl.Spec.Mstr. Aug. 27, 1993). See also footnote 10, *infra*.

9. Commenting on this requirement in the analogous context of the Administrative Procedure Act, 5 U.S.C. § 701 *et seq.* (1994), the Supreme

Court has stated that, under the arbitrary and capricious standard, "the agency must examine the relevant data and articulate a satisfactory explanation for its action including a 'rational connection between the facts found and the choice made.'" *Motor Vehicle Mfrs. Ass'n v. State Farm Mutual Automobile Ins. Co.*, 463 U.S. 29, 43, 103 S.Ct. 2856, 77 L.Ed.2d 443 (1983) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168, 83 S.Ct. 239, 9 L.Ed.2d 207 (1962)). In addition, the Supreme Court has held that while it may "uphold a decision of less than ideal clarity if the agency's path may reasonably be discerned," *Bowman Transp., Inc. v. Arkansas-Best Freight Sys., Inc.*, 419 U.S. 281, 285, 95 S.Ct. 438, 42 L.Ed.2d 447 (1974), it "may not supply a reasoned basis for the agency's action that the agency itself has not given," *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 43, 103 S.Ct. 2856 (citing *SEC v. Chenery Corp.*, 332 U.S. 194, 196, 67 S.Ct. 1575, 91 L.Ed. 1995 (1947)).

Unfortunately, this is not the first time that this Special Master has so erred—nor the first time that a remand has been ordered, as a result. In *Cook v. Sec'y of Health and Human Services*, No. 00-331V, the Special Master was faced, as here, with a claim that an acellular DPT vaccine had caused afebrile seizures. In denying that claim, again without an evidentiary hearing, the Special Master found statements by the petitioner's mother to be incredible and conclusions reached by Dr. Tornatore—the same—to be “strained and not merited.” And she again string-cited cases for the proposition that “[t]he undersigned has never accepted that either whole cell or acellular DPT causes afebrile seizures,” and relied, in some unspecified degree, upon Internet articles that she had introduced into the record shortly before issuing her decision. Rejecting these procedures out of hand, this court, in an order dated June 23, 2005, stated that—

A hearing would have granted both parties their day in court by allowing both parties the opportunity to present expert witnesses on their own behalf and evidence in response to the material the Special Master introduced into the record. Moreover, failing to have the petitioner's mother testify did not provide the Special Master with the ability to reach a reasonable, necessary, and logical decision concerning her credibility. Because the Special Master dismissed the case without the benefit of a

hearing, the undersigned believes that the parties were not offered “a full and fair opportunity to present their case,” and fairness would be best served by allowing the opportunity for a hearing. Moreover, the Special Master allowed inadequate time for the parties to respond to her additions to the record, even in writing, when she made the information available to the parties only 12 days and 5 days prior to issuing her decision.

Cook v. Sec'y of Health and Human Servs., No. 00-331V at 2 (Fed.Cl. Jun 23, 2005). Based upon this analysis, this court remanded the matter to the Special Master, finding that the circumstances “necessitate[d] a hearing to allow this court to properly review the credibility assessments made by the Special Master and the record in this case.” *Id.*

On remand, the Special Master, now armed with the testimony derived from a full evidentiary hearing, abruptly reversed course on numerous counts—including her ultimate decision. The Special Master found that at least some forms of nonfebrile seizures could be caused by the acellular DPT vaccine. She distinguished the string cite of cases that she had previously relied upon for the proposition that DPT does not cause afebrile seizures, as instead only involving “isolated, afebrile seizure[s] after receiving DPT *without any other symptoms.*” *Cook v. Sec'y of Health and Human Servs.*, 2005 WL 2659086 (Fed.Cl.Spec.Mstr. Sept. 21, 2005) (emphasis added).¹⁰ More strikingly,

10. A careful review of the facts in the string-cited cases reveals the highlighted statement to be untrue, as most of the cited cases described other symptoms, including several that involved what apparently were viewed as only “low grade” fevers. See *Borin v. Sec'y of Health and Human Servs.*, 2003 WL 21439673 (Fed.Cl.Spec.Mstr. May 29, 2003) (eye deviation and unresponsiveness hours after DPT vaccination; head CT, EEG and MRI 4 days later showed abnormalities); *Bruesewitz*, 2002 WL 31965744 (patient was shuddering, “not herself,” emitted “unusual cr[ies],” seemed tired, had brief periods of unresponsiveness, and had an elevated white count during the first 48 hours after her third DPT vaccination; patient later had seizures with low-grade fevers, but decision rejects compensation, noting that a temperature of 101.1° F is necessary to categorize a seizure as febrile); *Clements*, 1998 WL 481881 (fever of 101.3° F at hospital within 1 hour after seizure on same day as DPT vaccination; seizure held not febrile because it

was not 101.5° F or higher and occurred after the seizure, not before; claimant also was lethargic, experienced vomiting, broncho spasms, coarse respiratory breath sounds, and loose stools); *O'Connell*, 1998 WL 64185 (one day after 2d DPT vaccination, claimant had diminished appetite, was irritable, and suffered fevers of 101.4° F and 101.5°F associated with “jerking movements”; Special Master held jerking movements were not seizures); *Haim*, 1993 WL 346392 (twelve hours after first DPT vaccination, claimant was irritable, very sleepy and eating less; five days later, patient had multiple seizures and a fever of 101° F). It bears noting that in all five of these cases, the Special Master conducted an evidentiary hearing. Of the cases in the Special Master's string cite, the only case that appears to involve no symptoms other than seizures is *Nanez v. Sec'y of Health and Human Servs.*, 2003 WL 22434113 (Fed.Cl.Spec.Mstr. Sept. 23, 2003).

perhaps, in distinguishing her prior cases, the Special Master relied primarily upon the testimony of Dr. Tornatore—whom she had earlier found incredible and whom she found incredible here—finding that his explanation of the effect of the DPT vaccine “is credible and manifests a logical sequence of cause and effect.” *Id.* at 13. Moreover, there is not the slightest hint in her remand opinion that she continued to rely upon any of the articles that she found while surfing the web. Ultimately, contrary to her first summary finding, the Special Master concluded that “[p]etitioner is entitled to reasonable compensation.” *Id.*

Respondent attempts to blunt the accumulated force of these many concerns by serving up a many-colored splendor of palliatives, generic invocations of discretion, and blithe claims of harmless error. For example, it drily contends that *Cook* is distinguishable because, there, the Special Master gave the petitioners only 12 days to respond to her articles, but here allowed a full 21 days for that response. But, such distinctions are without a difference. Fundamentally, respondent utterly fails to come to grips with the fact that the procedures employed by the Special Master compounded error upon error, lacked fundamental fairness, and hence were arbitrary and capricious. One can only imagine how respondent would react if the situation were in reverse, that is, if a special master introduced into the record unverified medical articles browser-clipped from the Internet, gave respondent, via an unrecorded status conference, 15 days to respond, and then, without an evidentiary hearing, found respondent’s expert witnesses incredible—and on that basis awarded compensation. When posed this hypothetical at oral argument, respondent’s counsel had no ready reply. The response, of course, is—what is not good for the goose cannot be good for the gander.

III. CONCLUSION

This court need go no further. As Justice Cardozo once said, “[t]he concept of fairness

must not be strained till it is narrowed to a filament.”¹¹ Here, one must search to find even such a thread. While the court understands that exposure, over years, to dozens of cases involving similar issues might tempt one to take a “cookie cutter” approach to resolving causation issues, such an approach remains the antithesis of the individualized determinations required by the Vaccine Program.

For the foregoing reasons, the court finds that the Special Master acted in an arbitrary and capricious fashion in rendering her decision. The petitioner’s motion for review, therefore, is **GRANTED**. The Special Master’s Entitlement Decision of June 30, 2005, is hereby **VACATED** and this matter is **REMANDED** to the Office of Special Masters for further proceedings consistent with this opinion. Pursuant to Vaccine Rule 28, the period of this remand shall not exceed 90 days.¹²

IT IS SO ORDERED.



**PACIFIC GAS AND ELECTRIC
COMPANY, Plaintiff,**

v.

The UNITED STATES, Defendant.

No. 04-74C.

United States Court of Federal Claims.

Jan. 25, 2006.

Background: Electric utility brought suit against the United States seeking damages for breach of standard contract for disposal of spent nuclear fuel (SNF). Defendant

privileged materials subject to redaction prior to said date. Said materials shall be identified with specificity, both in terms of the language to be redacted and the reasons for that redaction.

11. *Snyder v. Massachusetts*, 291 U.S. 97, 122, 54 S.Ct. 330, 78 L.Ed. 674 (1934) (Cardozo, J.).

12. This opinion shall be unsealed, as issued, after February 13, 2006, unless the parties, pursuant to Vaccine Rule 18(b), identify protected and/or

advice for parents, or see **Where to ask questions**. For help with editing and other issues, see *Help:Contents*.

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About Wikipedia

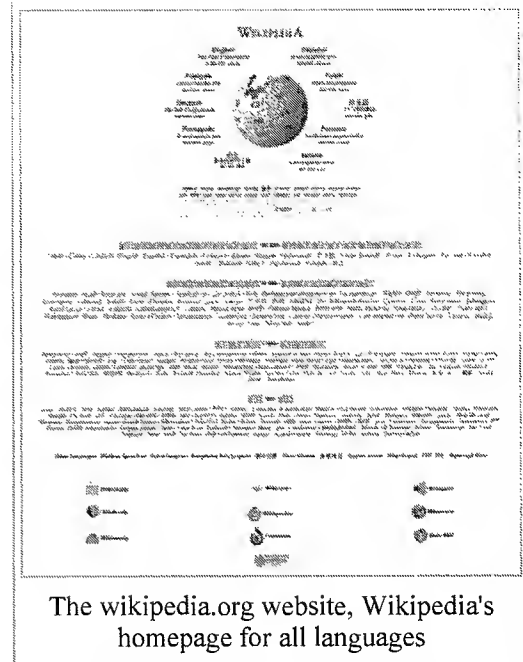
Wikipedia history

For more details on this topic, see History of Wikipedia.

Wikipedia was founded as an offshoot of Nupedia, a now-abandoned project to produce a free encyclopedia. Nupedia had an elaborate system of peer review and required highly qualified contributors, but the writing of articles was slow. During 2000, Jimmy Wales, founder of Nupedia, and Larry Sanger, whom Wales had employed to work on the project, discussed ways of supplementing Nupedia with a more open, complementary project. Multiple sources are suggested for the idea that a wiki might allow members of

the public to contribute material, and Nupedia's first wiki went online on January 10, 2001.

There was considerable resistance on the part of Nupedia's editors and reviewers to the idea of associating Nupedia with a Web site in the wiki format, so the new project was given the name "Wikipedia" and launched on its own domain, wikipedia.com, on January 15 (now called "Wikipedia Day" by some users). The bandwidth and server (in San Diego) were donated by Wales. Other current and past Bomis employees who have worked on the project include Tim Shell, one of the cofounders of Bomis and its current CEO, and programmer Jason Richey. The domain was eventually changed to the present wikipedia.org when the not-for-profit Wikimedia Foundation was launched as its new parent organization, prompting the use of a ".org" domain to denote its non-commercial nature. In March 2007, the word *wiki* became a newly recognized English word.^[1]



In May 2001, a wave of non-English Wikipedias was launched—in Catalan, Chinese, Dutch, Esperanto, French, German, Hebrew, Italian, Japanese, Portuguese, Russian, Spanish, and Swedish. These were soon joined by Arabic and Hungarian.^[2] In September,^[3] Polish was added, and further commitment to the multilingual provision of Wikipedia was made. At the end of the year, Afrikaans, Norwegian, and Serbocroatian versions were announced.

Trademarks and copyrights

Wikipedia is a registered trademark of the not-for-profit Wikimedia Foundation, which has created an entire family of free-content projects. On all of these projects, you are welcome to be bold and edit articles yourself, contributing knowledge as you see fit in a collaborative way.

Most of Wikipedia's text and many of its images are dual-licensed under the Creative Commons Attribution-Sharealike 3.0 Unported License (CC-BY-SA) and the GNU Free Documentation License (GFDL) (unversioned, with no invariant sections, front-cover texts, or back-cover texts). Some text has been imported only under CC-BY-SA and CC-BY-SA-compatible license and cannot be reused under GFDL; such text will be identified either on the page footer, in the page history or the discussion page of the article that utilizes the text. Every image has a description page which indicates the license under which it is released or, if it is non-free, the rationale under which it is used.

Contributions remain the property of their creators, while the CC-BY-SA and GFDL licenses ensure the content is freely distributable and reproducible. (See the copyright notice and the content disclaimer for more information.)

Wikipedia contributors

Anyone with Web access can edit Wikipedia, and this openness encourages inclusion of a tremendous amount of content. About 75,000 editors—from expert scholars to casual readers—regularly edit Wikipedia, and these experienced editors often help to create a consistent style throughout the encyclopedia, following our Manual of Style.

Several mechanisms are in place to help Wikipedia members carry out the important work of crafting a high-quality resource while maintaining civility. Editors are able to watch pages and techies can write editing programs to keep track of or rectify bad edits. Over 1,500 administrators with special powers ensure that behaviour conforms to Wikipedia guidelines and policies. Where there are disagreements on how to present facts, editors work together to arrive at an article that fairly represents current expert opinion on the subject. The administrators can temporarily or permanently ban editors of Wikipedia who fail to work with others in a civil manner.

Although the Wikimedia Foundation owns the site, it is largely uninvolved in writing and daily operations.

Making the best use of Wikipedia

Exploring Wikipedia

Many visitors come to this site to acquire knowledge, others to share knowledge. In fact, at this very instant, dozens of articles are being improved, and new articles are also being created. You can view changes as they happen at the Recent changes page. You also can view random articles. Over 2,000 articles have been designated by the Wikipedia community as featured articles, exemplifying the best articles in the encyclopedia. Another 5,000 articles are designated as good articles. Some information on Wikipedia is organized into lists; the best of these are designated as featured lists. Wikipedia also has portals, which organize content around topic areas; our best portals are selected as featured portals. You may also search for articles using the search box on the left side of the screen.

You also might enjoy reading Wikipedia in other languages. Wikipedia has more than two hundred different languages (see other language versions), including a Simple English version, and related projects include a dictionary, quotations, books, manuals, and scientific reference sources, and a news service (see sister projects). All of these are maintained, updated, and managed by separate communities, and often include thought-provoking information and articles that can be hard to find through other common sources.

Basic navigation in Wikipedia

Wikipedia articles are all linked, or cross-referenced. Wherever you see highlighted text like this, it means there is a link to some relevant article or Wikipedia page with further in-depth information elsewhere if you need it. Holding your mouse over the link will often show you where a link will take you. You are always one click away from more information on any point that has a link attached. There are other links towards the ends of most articles, for other articles of interest, relevant external Web sites and pages, reference material, and organized categories of knowledge which you can search and traverse in a loose hierarchy for more information. Some articles may also have links to dictionary definitions, audio-book readings, quotations, the same article in other languages, and further information available on our sister projects. You can add further links if a relevant link is missing, and this is one way to contribute.

Using Wikipedia as a research tool

As a wiki, articles are never complete. They are continually edited and improved over time. In general, this results in an upward trend of quality and a growing consensus over a fair and balanced representation of information.

Users should be aware that not all articles are of encyclopedic quality from the start: they may contain false or debatable information. Indeed, many articles start their lives as partisan; and, after a long process of discussion, debate, and argument, they gradually take on a neutral point of view reached through consensus. Others may, for a while, become caught up in a heavily unbalanced viewpoint which can take some time—months perhaps—to achieve better balanced coverage of their subject. In part, this is because editors often contribute content in which they have a particular interest and do not attempt to make each article that they edit comprehensive. However, eventually, additional editors expand and contribute to articles and strive to achieve balance and comprehensive coverage. In addition, Wikipedia operates a number of internal resolution processes that can assist when editors disagree on content and approach. Usually, the editors eventually reach a consensus on ways to improve the article.

The *ideal* Wikipedia article is well-written, balanced, neutral, and encyclopedic, containing comprehensive, notable, verifiable knowledge. An increasing number of articles reach this standard over time, and many already have. Our best articles are called Featured Articles (and display a small star in the upper right corner of the article), and our second best tier of articles are designated Good Articles. However, this is a process and can take months or years to be achieved, as each user adds their contribution in turn. Some articles contain statements which have not yet been fully cited. Others will later be augmented with new sections. Some information will be considered by later contributors to be insufficiently founded and, therefore, may be removed or expounded.

While the overall trend is toward improvement, it is important to use Wikipedia carefully if it is intended to be used as a research source, since individual articles will, by their nature, vary in quality and maturity. Guidelines and information pages are available to help users and researchers do this effectively, as is an article that summarizes third-party studies and assessments of the reliability of Wikipedia.

Wikipedia vs. paper encyclopedias

Main article: Wiki is not paper (on Wikimedia Meta-Wiki)

Wikipedia has advantages over traditional paper encyclopedias. Wikipedia has a very low "publishing" cost for adding or expanding entries and a low environmental impact, since it need never be printed. In addition, Wikipedia has wikilinks instead of in-line explanations and it incorporates overview summaries (article introductions) with the extensive detail of a full article. Additionally, the editorial cycle is short. A paper encyclopedia stays the same until the next edition, whereas editors can update Wikipedia at any instant, around the clock, to help ensure that articles stay abreast of the most recent events and scholarship.

Strengths, weaknesses, and article quality in Wikipedia

See also: Reliability of Wikipedia and Wikipedia:Researching with Wikipedia

Wikipedia's greatest strengths, weaknesses, and differences all arise because it is open to anyone, it has a large contributor base, and its articles are written by consensus, according to editorial guidelines and policies.

- Wikipedia is **open to a large contributor base**, drawing a large number of editors from diverse backgrounds. This allows Wikipedia to significantly reduce regional and cultural bias found in many other publications, and makes it very difficult for any group to censor and impose bias. A large, diverse editor base also provides access and breadth on subject

matter that is otherwise inaccessible or little documented. A large number of editors contributing at any moment also means that Wikipedia can produce excellent encyclopedic articles and resources covering newsworthy events within hours or days of their occurrence. It also means that like any publication, Wikipedia may reflect the cultural, age, socio-economic, and other biases of its contributors. There is no systematic process to make sure that "obviously important" topics are written about, so Wikipedia may contain unexpected oversights and omissions. While *most* articles may be altered by anyone, in practice editing will be performed by a certain demographic (younger rather than older, male rather than female, rich enough to afford a computer rather than poor, et cetera) and may, therefore, show some bias. Some topics may not be covered well, while others may be covered in great depth.

- Allowing **anyone to edit** Wikipedia means that it is more easily vandalized or susceptible to unchecked information, which requires removal. While blatant vandalism is usually easily spotted and rapidly corrected, Wikipedia is more subject to subtle viewpoint promotion than a typical reference work. However, bias that would be unchallenged in a traditional reference work is likely to be ultimately challenged or considered on Wikipedia. While Wikipedia articles generally attain a good standard after editing, it is important to note that fledgling articles and those monitored less well may be susceptible to vandalism and insertion of false information. Wikipedia's radical openness also means that any given article may be, at any given moment, in a bad state, such as in the middle of a large edit, or a controversial rewrite. Many contributors do not yet comply fully with key policies, or may add information without citable sources. Wikipedia's open approach tremendously increases the chances that any particular factual error or misleading statement will be relatively promptly corrected. Numerous editors at any given time are monitoring recent changes and edits to articles on their watchlist.
- Wikipedia is **written by open and transparent consensus** – an approach that has its pros and cons. Censorship or imposing "official" points of view is extremely difficult to achieve and usually fails after a time. Eventually for most articles, all notable views become fairly described and a neutral point of view reached. In reality, the process of reaching consensus may be long and drawn-out, with articles fluid or changeable for a long time while they find their "neutral approach" that all sides can agree on. Reaching neutrality is occasionally made harder by extreme-viewpoint contributors. Wikipedia operates a full editorial dispute resolution process, one that allows time for discussion and resolution in depth, but one that also permits disagreements to last for months before poor-quality or biased edits are removed.

That said, articles and subject areas sometimes suffer from significant omissions, and while misinformation and vandalism are usually corrected quickly, this does not always happen. (See for example this incident in which a person inserted a fake biography linking a prominent journalist to the Kennedy assassinations and Soviet Russia as a joke on a co-worker which went undetected for four months, saying afterwards he "didn't know Wikipedia was used as a serious reference tool.") Therefore, a common conclusion is that it is a valuable resource and provides a good reference point on its subjects.

The MediaWiki software that runs Wikipedia retains a history of all edits and changes, thus information added to Wikipedia never "vanishes". Discussion pages are an important resource on contentious topics. Therefore, serious researchers can often find a wide range of vigorously or thoughtfully advocated viewpoints not present in the consensus article. Like any source, information should be checked. A 2005 editorial by a BBC technology writer comments that these debates are probably symptomatic of new cultural learnings that are happening across all sources of information (including search engines and the

media), namely "a better sense of how to evaluate information sources."^[4]

Disclaimers

Wikipedia disclaimers apply to all pages on Wikipedia.

Wikipedia, in common with many Web sites, has a disclaimer that, at times, has led to commentators citing these in order to support a view that Wikipedia is unreliable. A selection of similar disclaimers from places which are often regarded as reliable (including sources such as Encyclopædia Britannica, Associated Press, and the Oxford English Dictionary) can be read and compared at Non-Wikipedia disclaimers. Wikipedia content advisories can also be found here.

Disclaimers

Core
disclaimers

General
Legal
Medical
Content
Risk

Other

Academic
use
Non-
Wikipedia

Contributing to Wikipedia

Main articles: Contributing to Wikipedia, First steps in editing articles, New contributors' help page
Guide to fixing vandalism: Help:Reverting

Anyone can contribute to Wikipedia by clicking on the *Edit this page* tab in an article. Before beginning to contribute however, you should check out some handy helping tools such as the tutorial and the policies and guidelines, as well as our welcome page. It is important to realize that in contributing to Wikipedia, users are expected to be civil and neutral, respecting all points of view, and only add verifiable and factual information rather than personal views and opinions. "The five pillars of Wikipedia" cover this approach and are recommended reading before editing. (Vandals are reported via the Administrator Notice Board and may be temporarily blocked from editing Wikipedia.)

Most articles start as stubs, but after many contributions, they can become featured articles. Once you have determined a topic you are interested in, you may want to request that the article be written (or you could even research the issue and write it yourself). Wikipedia has many on-going projects, focused on specific topic areas or tasks, which help coordinate editing. The hope of any contributor is to provide useful and accurate information to others, and the projects help coordinate efforts.

Editing Wikipedia pages

Main article, including list of common mark-up shortcuts: Wikipedia:How to edit a page

Wikipedia uses a simple yet powerful page layout to allow editors to concentrate on adding material rather than page design. These include automatic sections and subsections, automatic references and cross-references, image and table inclusion, indented and listed text, links, ISBNs, and math, as well as usual formatting elements and most world alphabets and common symbols. Most of these have simple formats that are deliberately very easy and intuitive.

The page layout consists of tabs along the top of the window. These are:

- *Article*. Shows the main Wikipedia article.
- *Discussion*. Shows a user discussion about the articles topics and possible topics, controversies, etc.
- *Edit this page*. This tab allows users to edit the article. Depending on the controversy surrounding

the topic, this tab may not be shown for all users. (For example, any user who is not an administrator, will not be able to edit the Main Page).

- *History*. This tab allows readers to view the editors of the article and the changes that have been made.
- *Watch*. By clicking on the *watch* tab, any changes made to the article will be displayed on your watchlist. (Note: when this tab is clicked, it changes to an *unwatch* tab.)

Wikipedia has robust version and reversion controls. This means that poor-quality edits or vandalism can quickly and easily be reversed or brought up to an appropriate standard by any other editor, so inexperienced editors cannot accidentally do permanent harm if they make a mistake in their editing. As there are many more editors intent on improving articles than not, error-ridden articles are usually corrected promptly.

Wikipedia content criteria

Wikipedia content is intended to be factual, notable, verifiable with cited external sources, and neutrally presented.

The appropriate policies and guidelines for these are found at:

1. Wikipedia:What Wikipedia is not, which summarizes what belongs in Wikipedia and what does not;
2. Wikipedia:Neutral point of view, which describes Wikipedia's mandatory core approach to neutral, unbiased article-writing;
3. Wikipedia:No original research, which prohibits the use of Wikipedia to publish personal views and original research of editors and defines Wikipedia's role as an encyclopedia of existing *recognized* knowledge;
4. Wikipedia:Verifiability, which explains that it must be possible for readers to verify all content against credible external sources (following the guidance in the Wikipedia:Risk disclaimer that is linked-to at the bottom of every article);
5. Wikipedia:Reliable sources, which explains what factors determine whether a source is acceptable;
6. Wikipedia:Citing sources, which describes the manner of citing sources so that readers can verify content for themselves; and
7. Wikipedia:Manual of Style, which offers a style guide - in general editors tend to acquire knowledge of appropriate writing styles and detailed formatting over time.

These are often abbreviated to WP:NOT, WP:NPOV, WP:NOR, WP:V, WP:RS, WP:CITE, and WP:MOS respectively.

Editorial administration, oversight, and management

The Wikipedia community is largely self-organising, so that anyone may build a reputation as a competent editor and become involved in any role he/she may choose, subject to peer approval. Individuals often will choose to become involved in specialised tasks, such as reviewing articles at others' request, watching current edits for vandalism, watching newly created articles for quality control purposes, or similar roles. Editors who find that editorial administrator responsibility would benefit their ability to help the community may ask their peers in the community for agreement to undertake such roles; a structure which enforces meritocracy and communal standards of editorship and conduct. At present, around a 75–80% approval rating after enquiry is considered the requirement for such a role, a standard which tends to ensure a high level of experience, trust, and familiarity across a broad front of

aspects within Wikipedia.

A variety of software-assisted systems and automated programs help several hundred editors to watch for problematic edits and editors. An arbitration committee sits at the top of all editorial and editor conduct disputes,^[5] and its members are elected in three regularly rotated tranches by an established enquiry and decision-making process in which all regular editors can equally participate.

Theoretically all editors and users are treated equally with no "power structure". There is, however a hierarchy of permissions:

1. *Anyone* can edit most of the articles here. Some articles are protected due to vandalism or edit-warring, and can only be edited by certain editors.
2. Anyone with an account that has been registered for four days or longer and made 10 edits becomes *Autoconfirmed*, and can do three things that IP users (also referred to somewhat incorrectly as "anonymous editors") cannot do:
 - They can move articles.
 - They can edit semi-protected articles.
 - They can vote in certain elections.
3. Many editors with accounts obtain access to certain tools that make editing easier and faster. Most of those tools, few learn about, but one common privilege granted to editors in good standing is "rollback", which is the ability to undo edits more easily.
4. Administrators ("admins" or "sysops") have been elected by the community, and have access to a few more tools. They can delete articles, can block accounts or IP addresses, and can edit fully protected articles.
5. The Arbitration Committee (ArbCom) is kind of like Wikipedia's supreme court. They deal with disputes that remain unresolved after attempts at dispute resolution have failed. Members of ArbCom are elected to three-year terms on a rotating schedule, and they tend to be selected from among the pool of admins.
6. Bureaucrats are elected via a process similar to how admins are selected. There are not very many B-crats, and they can add or remove admin rights, approve or revoke "bot" privileges, and rename user accounts.
7. Stewards are the top echelon, other than the Wikimedia Board of Directors. Stewards can do a few technical things, and one almost never hears much about them, as they normally only act when a local admin or bureaucrat is not available, and hence almost never on the English Wikipedia. There are very few stewards.

Jimmy Wales, technically a Steward, in 2009 was moved to a new user access group called Founder, but does not expect to be treated any differently than any other editor.

Handling disputes and abuse

Main articles: Wikipedia:Vandalism, Wikipedia:Dispute resolution, Wikipedia:Consensus, Wikipedia:Sock puppetry, Wikipedia:Conflict of interest

Wikipedia has a rich set of methods to handle most abuses that commonly arise. These methods are well-tested and should be relied upon.

- Intentional *vandalism* can be reported and corrected by anyone.
- Unresolved *disputes* between editors, whether based upon behavior, editorial approach, or validity of content, can be addressed through the talk page of an article, through requesting comments

from other editors or through Wikipedia's comprehensive dispute resolution process.

- *Abuse of user accounts*, such as the creation of "Internet sock puppets" or solicitation of friends and other parties to enforce a non-neutral viewpoint or inappropriate consensus within a discussion, or to disrupt other Wikipedia processes in an annoying manner, are addressed through the sock puppet policy.

In addition, *brand new users* (until they have established themselves a bit) may at the start find that their votes are given less weight by editors in some informal polls, in order to prevent abuse of single-purpose accounts.

Editorial quality review

As well as systems to catch and control substandard and vandalistic edits, Wikipedia also has a full style and content manual and a variety of positive systems for continual article review and improvement. Examples of the processes include peer review, good article assessment, and the featured article process, a rigorous review of articles that are intended to meet the highest standards and showcase Wikipedia's capability to produce high-quality work.

In addition, specific types of article or fields often have their own specialized and comprehensive projects, assessment processes (such as biographical article assessment), and expert reviewers within specific subjects. Nominated articles are also frequently the subject of specific focus under projects such as the Neutrality Project or are covered under editorial drives by groups such as the Cleanup Taskforce.

Technical attributes

Wikipedia uses MediaWiki software, the open-source program used not only on Wikimedia projects but also on many other third-party Web sites. The hardware supporting the Wikimedia projects is based on several hundred servers in various hosting centers around the world. Full descriptions of these servers and their roles are available on this meta page. For technical information about Wikipedia, you can check Technical FAQs. Wikipedia publishes various types of metadata; and, across its pages, are many thousands of microformats.

Feedback and questions

Wikipedia is run as a communal effort. It is a community project whose result is an encyclopedia. Feedback about content should, in the first instance, be raised on the discussion pages of those articles. You are invited to be bold and edit the pages yourself to add information or correct mistakes if you are knowledgeable and able to do so.

Frequently asked questions (FAQ)

- FAQ Index
- Category:Wikipedia FAQ

Giving feedback

There is an established escalation-and-dispute process within Wikipedia, as well as pages designed for questions, feedback, suggestions, and comments:

- Talk pages—the associated discussion page for discussion of an article or policy's contents (usually the first place to go);
- Wikipedia:Vandalism—a facility for reporting vandalism (you are encouraged to fix vandalism yourself as well as report it);
- Dispute resolution—the procedure for handling disputes that remain unresolved within an article's talk space; and
- Village pump—the Wikipedia discussion area, part of the community portal.

See also:

- Bug tracker—a facility for reporting problems with the Wikipedia Web site or the MediaWiki software that runs it;
- Village pump: proposals page—a place for making non-policy suggestions; and
- Wikipedia:Help desk—Wikipedia's general help desk, if other pages have not answered your query.

Research help and similar questions

Facilities for help for users researching specific topics can be found at:

- Wikipedia:Requested articles—to suggest or request articles for the future.
- Wikipedia:Reference desk—to ask for help with any questions, or in finding specific facts.

Because of the nature of Wikipedia, it is encouraged that people looking for information should try to find it themselves in the first instance. If, however, you come across valid information missing from Wikipedia, be bold and add it yourself so others can gain from your research, too.

Community discussion

For specific discussion not related to article content or editor conduct, see the Village pump, which covers such subjects as announcements, policy and technical discussion, and information on other specialized portals such as the help, reference and peer review desks. The Community Portal is a centralized place to find things to do, collaborations, and general editing help information, and find out what is happening.

Contacting individual Wikipedia editors

If you need more information, the first place to go is the Help:Contents. To contact individual contributors, leave a message on their talk page. Standard places to ask policy and project-related questions are the village pump, online, and the Wikipedia mailing lists, over e-mail. You can also reach other Wikipedians via IRC and e-mail.

In addition, you could try the Wikimedia Foundation **meta-wiki**, a site for coordinating the various Wikipedia projects and sister projects (and abstract discussions of policy and direction). Also available are many different places for submitting bug reports and feature requests.

For a full list of contact options, see **Wikipedia:Contact us**.

Related versions and projects

This Wikipedia is written in English. Started in 2001, it currently contains 2,953,466 articles. Many other Wikipedias are available; some of the largest are listed below.

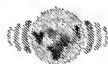
- More than 250,000 articles: Deutsch • Español • Français • Italiano • Nederlands • 日本語 • Polski • Português • Русский • Svenska • 中文
- More than 100,000 articles: العربية • Bahasa Indonesia • Català • Čeština • Dansk • Esperanto • 한국어 • Magyar • Norsk (bokmål) • Română • Slovenčina • Suomi • Türkçe • Українська
- More than 40,000 articles: Bahasa Melayu • Български • Eesti • Ελληνικά • English (simple) • فارسی • Galego • עברית • Hrvatski • Lietuvių • Norsk (nynorsk) • Slovenščina • Српски / Srpski • ไทย • Tiếng Việt

Sister projects

Wikipedia is hosted by the Wikimedia Foundation, a non-profit organization that also hosts a range of other projects:



Commons
Free media repository



Wikinews
Free-content news



Wiktionary
Dictionary and thesaurus



Wikiquote
Collection of quotations



Wikibooks
Free textbooks and manuals



Wikisource
Free-content library



Wikispecies
Directory of species



Wikiversity
Free learning materials and activities



Meta-Wiki
Wikimedia project coordination

Please note that while other sites may also use MediaWiki software and therefore look similar to Wikipedia, or may have a name that includes 'Wiki-' or '-pedia', or a similar domain name, the only projects which are part of the Wikimedia Foundation are those listed above, even if other projects claim to be part of it.

See also

- Wikipedia
- Wikipedia:Quality control
- Ten things you probably did not know about Wikipedia
- Meta:Power structure
- List of online encyclopedias - compare Wikipedia to other projects in a convenient chart

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3. ^ "Wikipedia announcements — September 2001".
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4. ^ Bill Thompson, "What is it with Wikipedia?", *BBC*, December 16, 2005.
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Further reading

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- Wikimedia Foundation activities in February 2008

Retrieved from "<http://en.wikipedia.org/wiki/Wikipedia:About>"

Categories: Wikipedia basic information

Hidden categories: Semi-protected project pages

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Wikipedia:Researching with Wikipedia



From Wikipedia, the free encyclopedia

This page in a nutshell: You should not use Wikipedia by itself for primary research (unless you are writing a paper about Wikipedia).

Wikipedia can be a great tool for learning and researching information. However, as with all sources, not everything in Wikipedia is accurate, comprehensive, or unbiased. Many of the general rules of thumb for conducting research apply to Wikipedia, including:

- Always be wary of any one single source (in any medium — web, print, television or radio), or of multiple works that derive from a single source.
- Where articles have references to external sources (whether online or not) read the references and check whether they really do support what the article says.
- In most academic institutions, Wikipedia, along with most encyclopedias, is unacceptable as a major source for a research paper. Other encyclopedias, such as *Encyclopædia Britannica*, have notable authors working for them and may be cited as a secondary source in most cases. For example, Cornell University has a guide (http://www.library.cornell.edu/newhelp/res_strategy/citing/apa.html) on how to cite encyclopedias.

However, because of Wikipedia's unique nature, there are also some rules for conducting research that are special to Wikipedia, and some general rules that do not apply to Wikipedia.

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Background knowledge for researchers about Wikipedia

*Potential researchers and other serious users are **strongly encouraged** to read **About Wikipedia** for a summary overview and understanding of Wikipedia.*

Overview of Wikipedia

In a wiki, articles are never "finished". They are continually edited and (usually) improved over time. In general this results in an upward trend of quality and a growing consensus over a fair and balanced representation of information.

Users should be aware that not all articles are of encyclopedic quality from the start. Indeed, many articles start out by giving one—perhaps not particularly evenhanded—view of the subject, and it is after a long process of discussion, debate, and argument that they gradually take on a consensus form. Others may become caught up in a heavily unbalanced viewpoint and can take some time—months perhaps—to regain a better-balanced consensus.

In part, this is because Wikipedia operates mainly on an informal process to resolve such issues. When editors cannot agree on content and approach, it is likely to take a bit of time before more experienced editors enter the picture. Even then, on inherently controversial topics, those more experienced editors may have their own axes to grind.

The *ideal* Wikipedia article is balanced, neutral, and encyclopedic, containing notable verifiable knowledge. Over time, an increasing number of articles have reached this standard. However, this process can take months or years, as each user contributes in turn. Some articles contain statements and claims that have not yet been fully cited. Others will later have entire new sections added. Some information now in the article may be considered by later contributors to be insufficiently founded and may be removed or expanded.

While the overall trend is **generally** upward, it is not **uniformly** upward. It is important to use Wikipedia carefully if it is intended to be used as a research source. Individual articles will, by the very nature of Wikipedia, vary in standard and maturity. This page is intended to help users and researchers do this effectively.

See also the article Reliability of Wikipedia, which summarizes third-party studies and assessments of Wikipedia.

Notable strengths of Wikipedia

Main article: Wikipedia:Why Wikipedia is so great

Wikipedia has certain advantages over other reference works. Being web-based and having a very large number of active writers and editors, it provides fast coverage of many topics and provides hyperlinking, unavailable in traditional media.

Also, it often provides access to subject matter that is otherwise inaccessible in non-native languages. Since English Wikipedia editors come from all around the world, the relative lack of non-Western topics

found in many Western publications is significantly less noticeable on Wikipedia.

Wikipedia often produces excellent articles about newsworthy events within days of their occurrence, such as the *2007 Wimbledon Championships*, *Lal Masjid siege*, *Kidnapping of Alan Johnston* or the *Benoit family tragedy*. Similarly, it is one of the few sites on the web even attempting neutral, objective, encyclopedic coverage of popular culture, including television series or science fiction. It is also developing across-the-board global coverage of subject areas where for one reason or another existing sources are highly fragmented, including sports such as football/soccer and golf.

In comparison with most other web-based resources, Wikipedia's open approach tremendously increases the chances that any particular factual error or misleading statement will be promptly corrected. As Wikipedia is a collaborative, ongoing project, one may also ask questions of an article's authors. And thanks to its extensive hyperlinks and external links usage wiki can be an excellent guide to other related material, both on and off Wiki.

Notable weaknesses of Wikipedia

Main article: Wikipedia:Why Wikipedia is not so great

Wikipedia's most dramatic weaknesses are closely associated with its greatest strengths. Wikipedia's radical openness means that any given article may be, at any given moment, in a bad state: for example, it could be in the middle of a large edit or it could have been recently vandalized. While blatant vandalism is usually easily spotted and rapidly corrected, Wikipedia is certainly more subject to subtle vandalism and deliberate factual errors than a typical reference work.

Also, much as Wikipedia can rapidly produce articles on timely topics, it is also subject to remarkable oversights and omissions. There is no systematic process to make sure that "obviously important" topics are written about, so at any given time Wikipedia may be wildly out of balance in the relative attention paid to two different topics. For example, it is far more likely that the English-language Wikipedia will have at least some material about any given small U.S. village than about a given moderately-sized city in sub-Saharan Africa.

Another closely-related issue is that particular Wikipedia articles (or series of related articles) are liable to be incomplete in ways that would be unusual in a more tightly-controlled reference work. Sometimes this is obvious (as with a stub article) but other times it may be subtle: one side of a controversial issue may be excellently presented, while the other is barely mentioned; a portion of someone's life (not always the most notable portion) may be covered in detail, while other aspects may be presented only sketchily or not at all; coverage of a country's history may focus on the incidents that drew international attention, or may simply reflect the interest and expertise of some individual writer.

Another problem with a lot of content on Wikipedia is that many contributors do not cite their sources — something that makes it hard for the reader to judge the credibility of what is written. As of 2008, this problem has almost certainly been diminishing over the last several years, but it has not gone away.

Article quality in Wikipedia

Main article: Reliability of Wikipedia

Wikipedia is a wiki — a collaborative, open-source medium. Just as human knowledge evolves, so does our wiki coverage of it. Wiki articles are continually edited and improved over time, and in general this results in an upward trend of quality and a growing consensus over a fair balanced representation of

information. It will tend to gain citations, new sections, and so forth. Dubious statements tend to be removed over time, but they may have a long life before they are removed.

However, few articles are of encyclopedic quality from the start. Indeed, many articles commence their lives as partisan drafts, and it may take a long process of discussion, debate, and argument to yield a consensus form. Other articles may, for a while, become caught up in a heavily unbalanced viewpoint, and it can take some time to restore a balanced consensus. Wikipedia has various processes to reach consensus about an article, including mechanisms to bring in broader participation to controversial articles.

The *ideal* Wikipedia article is neutral, referenced, and encyclopedic, containing notable, verifiable knowledge. An increasing number of articles reach this standard over time. Because this is an open wiki, there is no guarantee that a featured article retains its quality over time, and of course an older featured article does not magically improve as Wikipedia's standards generally rise. As of August 2006, 19% of one-time feature articles degraded, or failed to rise with the general standards, to the point of losing their featured status.

Keep in mind that an encyclopedia is intended to be a *starting point* for serious research, not an endpoint. Though many casual inquiries will be satisfied merely by referring to Wikipedia, you will learn more by accessing the print and online resources we reference. We encourage you to verify our content by using independent sources. We also invite you to contribute back by fixing any errors you may find and adding relevant material that will be of interest to future researchers.

Editorial administration, oversight and management

Main article: Wikipedia:Editorial oversight and control

The Wikipedia community is largely self-organising, so that anyone may build a reputation as a competent editor and become involved in any role they may choose, subject to peer approval. Individuals often will choose to become involved in specialized tasks, such as reviewing articles at others' request, watching current edits for vandalism, or watching newly created articles for quality control purposes, or similar roles. Editors who find that editorial administrator responsibility would benefit their ability to help the community may ask their peers in the community for agreement to undertake such roles; a structure which enforces meritocracy and communal standards of editorship and conduct. Administrative and other similar roles are achieved only after a nomination process and a poll that shows at least 75-80% approval, a standard which tends to ensure a high level of experience, trust, and familiarity across a broad front of projects within Wikipedia.

A variety of software assisted systems and automated programs help several hundred editors to watch for problematic edits and editors. An arbitration committee sits at the top of all editor conduct disputes,^[1] and its members are elected by an established enquiry and decision-making process in which all regular editors can equally participate.

Special research considerations concerning Wikipedia

Use multiple independent sources

Because Wikipedia is licensed under the GFDL, its content is often reproduced, especially online. Researchers should be especially careful of the FUTON bias ("Full Text On the Net" bias) and ensure that a second article appearing to confirm a Wikipedia article is not (for example) simply a copy of an

earlier version. One place to look for additional sources to use in assessing the quality of a Wikipedia article is to look at the sources it cites. An article that faithfully reflects the information and intent of a large number of high quality sources is likely to be a very reliable indicator of the current state of knowledge on a subject. An article with fewer or no sources listed or sources of lower quality may not reflect a researcher's desired high quality. The only way to ensure the article faithfully reflects the information in high quality sources is to read and understand the cited sources and perhaps others. Often at the least a Wikipedia article will be an excellent overview of a given subject, making it easier to understand the cited sources and know what type of information to look for.

Examine an article's history

Main article: Wikipedia:How to read an article history

The process of creating Wikipedia is radically open. As a result, unlike most reference works it is possible that even for a generally excellent and stable article, the latest version at any given moment may have been subject to recent edits which are not of the same quality as the rest of the article.

However, unlike most reference works, you can access the history of the article (previous versions and change comments) and the discussion between the editors who created it. Often, if you have questions about an article or are looking to do in-depth research on a subject, reading the history and talk pages gives you further insight into why the article says what it says and which points of the article (if any) are in dispute and may particularly merit further research.

Internal links

Wikipedia breathes new life into one of the initial dreams of the World Wide Web: hyperlinks. Hyperlinks allow Wikipedia authors to link any word or phrase to another Wikipedia article, often providing annotations of great value. Background information to an article no longer needs to be limited or even produced by the author of the article. This method has proved to have major limitations on the Internet as a whole, because for a variety of reasons links are prone to quickly become obsolete. However, internal links within Wikipedia can be made with confidence, and so Wikipedia serves a web of mutually supporting information.

Some articles are probably over-linked with important links liable to be lost like needles in a haystack. Also, someone may have linked a word without looking to see whether it leads to anything useful: you may follow up a link and find nothing more than what you just read, or even find an article on an unrelated meaning of the same word. In general, this problem is less common in the English-language Wikipedia than in Wikipedias in some other languages.

Categories

Wikipedia has had its own user defined category system (folksonomy) since the beginning of 2004. The category system is a collaborative categorization system using freely chosen keywords by all contributors to Wikipedia. This feature allows researchers to navigate Wikipedia via categories, which can be very useful.

Virtually all articles now have some form of categorization; however, the quality of this can be highly variable. In many topic areas contributors have created detailed and well-organized categorization; in other topic areas, categorization has occurred in a more *ad hoc* fashion and is sometimes poorly done.

In all categorized articles, you should be able to find a list of categories at the very bottom.

Take advantage of "what links here"

One of the lesser known, but extremely useful techniques for researching with Wikipedia is the effective use of the "What links here" link which appears on the left side of the screen, as the first item in the box marked "toolbox". This will give you a complete list of other Wikipedia articles which link to the current article. Even if the article you are looking at is a stub — or, more remarkably, if it is a blank article that has not yet been started — numerous related articles may be easily accessible through this feature. Sometimes these backward links will show you ways in which the article you started from is incomplete in one area or another.

Take advantage of "printable version"

Another feature of the "toolbox" is the "Printable version". Use it whenever you want to print articles for a printer-friendly version of the article. Browsers, such as Mozilla Firefox, that recognize the media print will automatically apply the printable version when printing with the default Monobook stylesheet.

Understand Wikipedia's biases

No good scholar expects any given reference work to be truly unbiased. Instead, one comes to understand the expected bias of a particular work. For example, in looking at the *1911 Encyclopædia Britannica*, one expects to find some Anglocentric perspectives and attitudes about race, ethnicity, sex, and sexuality that by today's standards seem prudish and perhaps bigoted. In using *Collier's Encyclopedia*, one should expect a rather Americentric perspective (and probably a lesser degree of scholarship than in *Britannica*, but a more easily readable style).

Unlike some reference works, Wikipedia's biases are inconsistent. Wikipedians come from all over the world and all walks of life. While we strive to have articles fit a neutral point of view, many articles are not yet there. In fact, two articles on related subjects may have been written by different people and reflect different biases. Even within a single article radically different or conflicting biases may be found. It is also a matter of contention whether certain views are described in a neutral manner.

In this respect, Wikipedia is more like a library (or like the World Wide Web itself) than like a typical reference work. The mere fact that a book is in the library is no guarantee against bias or misinformation. The same can be said of Wikipedia articles. This does not make them useless, it just means that they should be approached differently than one approaches a typical reference work.

Use Wikipedia's social process

Main articles: Wikipedia:Who writes Wikipedia and Wikipedia:A researcher's guide to discussion pages

Wikipedia is not just an encyclopedia; it is also an immense community of active contributors, or Wikipedians. In the history section of each article, you can find out which users contributed what material to an article. In addition, each article has a talk page. If you have questions about the article, asking on its talk page or the talk page of the users who contributed the text will often get your question answered. Then, you and the contributor may update the article to make it clearer for the next researcher.

Probably the most general approach to this is to first put your question on the talk page of the appropriate article, then put a note on the talk page of the relevant contributor or contributors calling

their attention to your question.

Questions like this are often very useful to the refinement of articles. If you have a relevant question that was not answered by the article, there is a fair chance that others will need this information also, and it should be added to the article.

In general, you should not expect Wikipedians to contact you by email. Instead, check back to the talk page periodically to see if your question has been answered.

We strongly recommend that if you want to participate in the Wikipedia community you create a Wikipedia account (it's free, you don't need to provide any personal or contact information, and there won't be any spam). If you log in, and if you sign your posts on talk pages with ~~~~, that will be saved on the talk page as an account signature and a timestamp. Posting to talk pages with an account is not only a local social norm, but it makes it possible for you to retain your identity across multiple editing sessions and avoid being confused with others.

Look for comprehensive review

A small number of English-language Wikipedia articles — most notably, featured articles — have had broad, systematic review. These articles usually remain at a high level of quality, but it is possible (although unlikely) that a previously reviewed article may have deteriorated since the time it received that level of attention.

Wikipedia:WikiReader discusses one of the more ambitious schemes to bring a comparable level of scrutiny to a large number of articles. As of November 2004, there have been no English-language WikiReaders published, although at least two have been issued in German, and a number of English-language WikiReaders are in progress.

Another proposed approach to formally reviewing more articles can be found at Wikipedia:WikiProject Fact and Reference Check; however, this project is still in its infancy, as is Wikipedia:Forum for Encyclopedic Standards.

Despite this shortage of formal review, many articles have had enormous scrutiny. Again, this can often be identified informally by browsing the history and discussion associated with the article.

Citing Wikipedia

Main article: Wikipedia:Citing Wikipedia

First you should question the appropriateness of citing any encyclopedia as a source or reference. This is not simply a Wikipedia-specific issue, as most secondary schools and institutions of higher learning do not consider encyclopedias, in general, a proper citable source. Citation of Wikipedia in research papers has been known to result in a failing grade.^[2]^[3]

This does not mean Wikipedia is not useful: Wikipedia articles contain many links to newspaper articles, books (often with ISBN numbers), radio programming, television shows, Web-based sources, and the like. It will usually be more acceptable to cite those *original sources* rather than Wikipedia since it is, by nature, a *secondary source*. At the same time, simple academic ethics require that you should actually read the work that you cite: if you do not actually have your hands on a book, you should not misleadingly cite it as your source.

There are cases where contributions to Wikipedia are considered original and important enough on topics not covered in other works, so as to be considered a primary source. (For example, according to the New York Times' website, "The Supreme Court of Iowa cite[d] Wikipedia to explain that “jungle juice” is 'the name given to a mix of liquor that is usually served for the sole purpose of becoming intoxicated.'" ^[4]

Owing to the radical openness of Wikipedia, decisions about referencing articles must be made on an article-by-article basis. If one does choose to cite a Wikipedia article, references should identify a specific version of an article by providing the date and time it was created. This can be found in the edit history of the article.

If you decide to cite Wikipedia, remember that its articles are constantly changing: cite exact time, date, and version of the article version you are using. Page history and toolbox features "cite this article" and "permanent link" are very useful for finding that information. For example, the link en.wikipedia.org/w/index.php?title=Wikipedia:Researching_with_Wikipedia&oldid=101425275 (http://en.wikipedia.org/w/index.php?title=Wikipedia:Researching_with_Wikipedia&oldid=101425275) is for a specific version of this page created at 22:13 on 17 January 2007; 101425275 is the article version number. The link will display the article as it existed at that time; no later revisions will be included in the text.

Wikipedia:Wikipedia as an academic source pages contains examples of academic publications that used Wikipedia as a source.

Further help

Frequently asked questions (FAQ)

Main article: Wikipedia:FAQ

FAQ index: Index of all Wikipedia FAQ pages

Other help and feedback

There is an established escalation and dispute process within Wikipedia, as well as pages designed for raising questions, feedback, suggestions and comments, and community discussion. (See About Wikipedia).

Facilities for help for users researching specific topics can be found at:

- [Wikipedia:Requested articles](#) — to suggest or request articles for future.
- [Wikipedia:Reference desk](#) — to ask for help with any questions, or in finding specific facts.
- [Wikipedia:Help desk](#) — Wikipedia's general help desk, if other pages haven't answered your query.

Because of the nature of Wikipedia, it's encouraged that people looking for information should try to find it themselves in the first instance. If, however, you come across valid information missing from Wikipedia, **be bold** and add it yourself so others can gain from your research, too!

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See also

- Reliability of Wikipedia - assessments of reliability
- Wikipedia:A researcher's guide to discussion pages
- Wikipedia:Academic resources - collection of useful resources (links to journals, etc.)
- Wikipedia:Academic use - considerations for using Wikipedia as a source for academic work (including a mention that some schools object to citing encyclopedias in general and Wikipedia in particular).
- Wikipedia:Content disclaimer: Wikipedia contains content you may find objectionable; it also contains spoilers
- Wikipedia>Edit war: At any given time, a Wikipedia article may be involved in an "edit war".
- Wikipedia:General disclaimer
- Wikipedia:Legal disclaimer: Wikipedia does not give legal opinions
- Wikipedia:Medical disclaimer: Wikipedia does not give medical advice
- Wikipedia:No original research/Wikipedia:Verifiability - Wikipedia is not the place to publish new, original research or find research which has not yet been recognized by credible sources
- Wikipedia:Patent nonsense: At any given time, a Wikipedia article may contain nonsense.
- Wikipedia:Point of view: At any given time, a Wikipedia article may not have a neutral point of view.
- Wikipedia:Reference desk - our help desk, feel free to ask any questions
- Wikipedia:Replies to common objections
- Wikipedia:Researching Wikipedia - academic research about Wikipedia, and Wikipedia:WikiProject Wikidemia - a related project
- Wikipedia:Risk disclaimer: Use Wikipedia at your own risk.
- Wikipedia:School and university projects - Wikipedia as a teaching tool
- Wikipedia:Vandalism: At any given time, a Wikipedia article may be vandalized.
- Wikipedia:Why Wikipedia is not so great, Criticism of Wikipedia and Wikipedia:Criticisms list some additional issues about Wikipedia (and what we try to do to mitigate them)
- Wikipedia:Wikipedia as an academic source - list of cited uses
- Wikipedia:Wikipedia in academic studies - list of studies

External links

- How to Evaluate a Wikipedia Article
(http://upload.wikimedia.org/wikipedia/en/1/16/How_to_evaluate_a_Wikipedia_article.pdf) - A one-page PDF with similar recommendations to this page.
- Evaluating Web Pages: Techniques to Apply & Questions to Ask
(<http://www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html>) from the University of California, Berkeley
- Critically Analyzing Information Sources
(<http://www.library.cornell.edu/olinuris/ref/research/skill26.htm>) from Cornell University
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Categories: Wikipedia resources for researchers

Hidden categories: Semi-protected project pages

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Comparison of *Wikipedia* and other encyclopedias for accuracy, breadth, and depth in historical articles

Wikipedia
and other
encyclopedias

7

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Abstract

Purpose – This paper seeks to provide reference librarians and faculty with evidence regarding the comprehensiveness and accuracy of *Wikipedia* articles compared with respected reference resources.

Design/methodology/approach – This content analysis evaluated nine *Wikipedia* articles against comparable articles in *Encyclopaedia Britannica*, *The Dictionary of American History* and *American National Biography Online* in order to compare *Wikipedia*'s comprehensiveness and accuracy. The researcher used a modification of a stratified random sampling and a purposive sampling to identify a variety of historical entries and compared each text in terms of depth, accuracy, and detail.

Findings – The study did reveal inaccuracies in eight of the nine entries and exposed major flaws in at least two of the nine *Wikipedia* articles. Overall, *Wikipedia*'s accuracy rate was 80 percent compared with 95-96 percent accuracy within the other sources. This study does support the claim that *Wikipedia* is less reliable than other reference resources. Furthermore, the research found at least five unattributed direct quotations and verbatim text from other sources with no citations.

Research limitations/implications – More research must be undertaken to analyze *Wikipedia* entries in other disciplines in order to judge the source's accuracy and overall quality. This paper also shows the need for analysis of *Wikipedia* articles' histories and editing process.

Practical implications – This research provides a methodology for further content analysis of *Wikipedia* articles.

Originality/value – Although generalizations cannot be made from this paper alone, the paper provides empirical data to support concerns regarding the accuracy and authoritativeness of *Wikipedia*.

Keywords Reference services, Encyclopaedias

Paper type Research paper

Introduction

Wikipedia, the collaborative work of 67,000 contributors, is currently the largest single encyclopedia, with 2,045,007 English articles as of October 12, 2007 (*Wikipedia*, 2007). While many (Benkler, 2006; Janes, 2005; Lessig, 2004; O'Leary, 2005) see *Wikipedia* as a valuable resource, others, particularly scholars and librarians (Achterman, 2005; Binkley, 2006; Ishizuka, 2004; Jacso, 2002; Read 2006a, b), question the accuracy, comprehensiveness and writing quality of *Wikipedia* entries and the authority of its contributors.

Interestingly, although many question *Wikipedia*'s strength as an encyclopedia, few (Giles, 2005; Rosenzweig, 2006) have actually compared *Wikipedia* to other sources to



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provide evidence supporting their concern. Research is needed to determine *Wikipedia's* place among reference works. This study will conduct a content analysis of *Wikipedia* and three other reputable history and general reference sources to compare their coverage of historical topics in terms of accuracy, breadth, and depth.

Literature review

Most reference works rely on scholars to write and edit their articles and essays. *Wikipedia*, however, allows anyone to contribute and edit encyclopedia entries. In fact, *Wikipedia* welcomes amateur contributors and notes that no formal training is required for posting an entry (*Wikipedia*, 2007). Unlike other reference sources, individual *Wikipedia* entries do not list authors' full or even real names, and authors do not post their credentials in terms of expertise in the field of their contributions. Without full disclosure of authorship, readers cannot verify the expertise of the author or even conduct further research on his/her credentials. Furthermore, while *Wikipedia* encourages authors to cite references, it realizes that many articles do not include sources (*Wikipedia*, 2007). The encyclopedia readily admits that there are certainly opportunities for vandalism, and the lack of an editorial board or governing process may result in under-coverage of certain topics. However, the encyclopedia believes that its openness allows for greater breadth and depth of many subjects, and any inaccuracies, inadvertent or malicious, may be corrected in a matter of hours, and new discoveries quickly added. It is precisely this open peer-production process that champions of *Wikipedia* cite as its greatest strength.

Is *Wikipedia* a reputable source? Should educators and librarians be embracing this living, growing text or should they continue to caution students and other users to evaluate *Wikipedia* content more carefully than that of other reference sources? In order to measure its relative coverage and scope, several studies have compared *Wikipedia* entries to those in well-respected reference works. Most (Giles, 2005; Lih, 2004; Rosenzweig, 2006) have found *Wikipedia* to be as accurate as other sources, although they have found minor factual mistakes and criticized the level of writing.

In a recent study conducted by the journal *Nature* (Giles, 2005), reviewers compared 21 science entries from both *Wikipedia* and *Encyclopaedia Britannica* and found that each encyclopedia contained four major errors. *Wikipedia* had 162 omissions or minor factual errors, while *Encyclopaedia Britannica* had 123. Rosenzweig (2006) compared 25 *Wikipedia* biographies to those in two other online resources (*American National Biography Online* and *Encarta*) and found *Wikipedia* to be less comprehensive and detailed than *American National Biography* but more so than *Encarta*.

Others, such as Alexander Halavais, have informally tested the encyclopedia by purposefully submitting erroneous material to see how quickly, if at all, the material is corrected (Read, 2006a). Halavais discovered that all of his 13 errors had been corrected within three hours of his postings. Weaver *et al.* (2006) examined relationships among *Wikipedia* entries connecting individuals, organizations, and places (for example, an article on US presidents would state that Woodrow Wilson was the 28th president and then would link directly to his biography, which would confirm his position as the 28th president). Their research found that of 200 statements in 73 entries, 97 percent were true. Another study (Korfiatis *et al.*, 2006) analyzed relationships among *Wikipedia* contributors and how they respected one another's work. These last two studies,

however, actually do not verify the accuracy of facts within *Wikipedia* or evaluate the writing quality.

Certainly more research is needed to measure the accuracy and authoritativeness of *Wikipedia* entries to satisfy academics' concern about the quality of the work. This content analysis attempts to expand that body of research.

Methodology

This study evaluated nine comparable entries in *Wikipedia*, *Encyclopaedia Britannica* (print and online), the *Dictionary of American History*, and *American National Biography Online* to compare the accuracy and thoroughness of *Wikipedia* entries to those of well-respected print reference sources.

To conduct such a comparison this study used two of the most reputable history sources and the most respected general encyclopedia, both print and electronic. The *Guide to Reference Books* (Balay, 1996), the bibliography that most academic libraries use to build their collections, list both prominently as subject-specific encyclopedias. The *Dictionary of American History* (3rd edition, 2003) is considered a required reference work in most academic libraries. The latest edition of ten volumes includes 4,434 articles with 1,200 illustrations and 252 maps (Ward, 2003). Subject experts write all entries. Several noted reviewers (Coutts and McConnell, 2004; Ward, 2003; Rettig, 2003; Browne, 2003) find that the new edition improves upon the success of previous editions and continues to be a standard historical reference. Balay (1996) states that the earlier revised edition (1976) thoroughly covers the social, political, economic and cultural history of the USA, omitting only biographies that are the purview of the *Dictionary of American Biography*.

For American biographies, the long-standing pre-eminent source was the *Dictionary of American Biography* (DAB), starting in the 1930s and continuing through 1988. The more recent *American National Biography* (1999; ANB) has replaced the DAB as the library standard. The American Library Association selected it as an Outstanding Reference Source in 2000 (Dalinsky, 2000), and the Association of American Publishers awarded the 24-volume work as its publication of the year (*Library Journal*, 2000). One reviewer considers it "an essential purchase for all academic and most large public libraries" (Coutts and Richard, 2000). The online version contains 17,400 biographies, including updated and new entries from the 1999 print edition, and 80,000 cross-references and external links (*American National Biography*, 2007).

The *Encyclopaedia Britannica* has a long established history as the premier general encyclopedia. Balay (1996) considers *Britannica* "the most famous encyclopedia in English, and for some purposes the best" (p. 107). The 14th edition, the *New Britannica*, made significant changes to its structure and organization. Balay (1996) continues, "All in all *Britannica* remains the most comprehensive, authoritative international encyclopedia in the English language" (p. 108). The 15th edition, first published in 2002, contains 64,862 entries in 32 volumes; 4,300 authors contributed articles. Its electronic counterpart, *Britannica Online*, has 118,270 entries with almost 18,000 illustrations and maps and includes video and audio clips as well as 135,000 links to other online references (Awe and Bibel, 2002). The new 2005 edition includes more than 65,000 articles and 24,000 images and maps (*Encyclopaedia Britannica*, 2006a). As of December *Britannica Online* has expanded to 122,264 articles (*Encyclopaedia Britannica*, 2006b).

Lastly, as mentioned earlier, *Wikipedia* is the largest online reference, with 75,000 contributors and 5,300,000 entries in 100 languages (*Wikipedia*, 2007). *Wikipedia* stands on three basic principles:

- (1) articles should present an unbiased or neutral description of the entry;
- (2) articles should be derived from reliable published sources and be verifiable; and
- (3) articles should not represent an author's original research (*Wikipedia*, 2006).

Wikipedia encourages contributors to cite sources used (*Wikipedia*, 2006), but numerous articles have few if any citations. Authors are anonymous and may not be experts in their subject area.

There are a number of challenges in conducting a content analysis of internet resources. First of all, the size of *Wikipedia* and other online sources makes it difficult to find truly representative samples. In addition, the fact that the online sources contain graphic, video and audio files as well as text complicates a direct comparison to print resources (Weare and Lin, 2000). Thirdly, web content almost invariably contains a number of links to additional material. While these links may be considered similar to "see also" references in a print source, the immediacy of the linked content encourages the reader to break from a linear reading of the content at hand with options for additional reading (Weare and Lin, 2000). Lastly, the dynamic nature of internet resources adds the challenge of capturing content that may be edited or completely rewritten in minutes or certainly days (Weare and Lin, 2000). This makes any particular snapshot of the content somewhat arbitrary.

Because this content analysis is partially qualitative in nature, White and Marsh (2006) recommend that the sampling be purposeful rather than completely random. In order to select a representative variety of historical articles, this study used a modification of stratified random and purposive sampling. The researcher first identified four types of historical entries:

- (1) place;
- (2) event;
- (3) movement or phenomena; and
- (4) biography.

The sampling began with the specialized history reference, the *Dictionary of American History (DAH)*. Within each volume the researcher randomly selected an entry, alternating among the four types of entries so that there were two biographies, two events, two places, and three movements/phenomena in total.

The nine selections were:

- (1) Badlands and Sand Creek (places);
- (2) The Chautauqua movement, the Free Soil party, and the Niagara movement (phenomena);
- (3) The Harper's Ferry raid and the Mexican-American War (events); and
- (4) William Kidd and Harriet Tubman (biographies).

Once the researcher identified examples of each type article in the historical encyclopedias, she found the comparable article in *Encyclopaedia Britannica* and

Wikipedia. For the two biographies, the researcher then selected the equivalent biographical essay in the *American National Biography Online*.

As mentioned, one difficulty of analyzing web content is its constantly changing nature. Of course, *Wikipedia* believes that its strength is its dynamicism. To address the rapid rate of content change, this analysis also briefly reviewed each *Wikipedia* article's history to note the quantity, type and scope of editorial changes over a specified period of time.

The study compared each text in terms of size, accuracy, detail, references (verifiability) and opportunities for further reading. Some of these concepts were quantified by such operational measures as word and fact counts and number of references. Other more qualitative concepts were measured by the accuracy of factual materials, the level of detail and the ability to verify entry content.

The study considered each entry (without links to external internet content or "see also" references) a unit of measure. The analysis included a word count and fact count for each entry and tallied the number of facts included in two or more sources as fact matches. The analysis also rated the reliability of those facts by checking them against additional historical and biographical sources (see list of references for fact checking). The analysis included a count of "see also" references in the print materials and contextual links in the online sources. The researcher checked authorship and bibliography citations. Each entry was compared to the other two in terms of matched facts, factual discrepancies, additional facts that were not included in the other sources and facts omitted that did appear in the other sources. The researcher calculated an overall accuracy rate by dividing the number of incorrect or partially incorrect facts by the total facts as well as by the total verifiable facts (subtracting the unverifiable facts from the total fact count).

Results

Badlands

The entries on badlands were three of the shortest essays examined. Table I shows the comparison among the four sources (including the print and online versions of *Encyclopaedia Britannica*) in their description of badlands. *Britannica* actually includes two entries on the badlands; one in terms of the geological phenomenon in general and one specifically on the Badlands National Park in South Dakota; the other two sources combine the two into single articles. Here *Britannica Online* (BO) has by far the longest of the entries (625 words); the print version and *Wikipedia* are next with slightly more than 250 words (253 and 258, respectively). All the facts are verifiable and correct; the difference here lay in the facts included. *Wikipedia* lists six additional facts concerning other badlands areas and national parks in North Dakota and Canada. The *Dictionary of American History* (DAH) provides history of the settlement of the area, and the history of paleontological discovery. *Britannica*, particularly BO, includes many new facts concerning the size, location and geographical description of Badlands National Park and its flora and fauna.

Because each entry focuses on different aspects of the phenomenon and region known as the badlands it is difficult to compare the four in terms of comprehensiveness. However, certainly *Britannica Online* has the most extensive entry. In terms of level of detail, both *Britannicas* and the *DAH* contain more specific

Table I.
Comparison of badlands
entries

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	258	152	253 (two articles)	625 (two articles)
Fact count	16	15	16	33
Fact matches	9	10	10	15
Additional facts	7	5	6	18
Unverifiable facts	0	0	0	0
Factual errors	0	0	0	0
Accuracy rate (percent)	100.0	100.0	100.0	100.0
Accuracy rate (excluding unverified facts, percent)	100.0	100.0	100.0	100.0
Images/media	2	1	0	3
Links	31	N/A	N/A	10
Bibliography	0	2	0	0
Author	N/A	Doane Robinson	N/A	N/A
“See also” references	0	2	0	0
Further reading	0	0	0	3

data. Furthermore, only the *DAH* includes a bibliography (two entries) and two “see also” references.

Chautauqua

The four essays on the Chautauqua movement vary considerably, and several facts here are unverifiable or erroneous. Table II details the evaluation of the entries. The two *Britannicas* are virtually identical. Ten facts are shared by all four sources. The *Dictionary of American History* (*DAH*) shares six each with *Britannica Online* (*BO*) and *Wikipedia*, while *BO* and *Wikipedia* share one. *Britannica* includes six otherwise

Table II.
Comparison of
Chautauqua entries

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	1,312	897	203	202
Fact count	110	90	23	23
Fact matches	16	21	17	17
Additional facts	94	69	6	6
Unverifiable facts	8	3	0	0
Factual errors	9	4	1	1
Accuracy rate (percent)	84.5	92.2	95.7	95.7
Accuracy rate (excluding unverified facts, percent)	91.2	95.4	95.7	95.7
Images/media	0	0	0	0
Links	68	0	0	0
Bibliography	3	4	0	0
Author	N/A	Andrew C. Rieser	N/A	N/A
“See also” references	0	6	1	0
Further reading	0	0	0	0

unmentioned facts, *DAH* contains 69 unmatched facts and *Wikipedia* contains 94 additional facts.

In this case, *Wikipedia* and *DAH* are relatively equal in their comprehensiveness, discussing the original Chautauqua as well as the local and circuit or tent Chautauqua movements. *DAH* also covers more on the history of the first Chautauqua and the growth of its offshoot, the Chautauqua Literary and Scientific Circles (CLSC), while *Wikipedia* has more breadth in the areas of music and other entertainment features and more recent history. *Wikipedia* has more unverifiable facts (eight) and inaccuracies (nine) than does *DAH*, but given that *Wikipedia* has 94 additional facts for a total of 110, it still holds a higher ratio of accuracy. Most of the factual errors are in the size of the movement (Scott, 1999; Bohn, 1826). Both entries are relatively succinct and tightly written. While the *Wikipedia* article does list four general references, its last paragraph on the comparison of Robert Pirsig's work, *Zen and the Art of Motorcycle Maintenance*, with Chautauquan themes contains quotes without attribution. Furthermore, the essay contains a quote attributed to Theodore Roosevelt with no reference/citation and another quote seemingly from Sinclair Lewis that was unverifiable and unattributed.

Here, the *Britannica* (both print and online) are the shortest and least comprehensive entries with 203/202 words and 23 facts. All of *Britannica*'s facts are verifiable; the only error is in the number of permanent, local assemblies at the height of the movement.

Free Soil Party

In the case of the entries on the Free Soil Party, the small political party of the 1840s and 1850s, none of the articles are particularly comprehensive and detailed, although the *Dictionary of American History* is the longest essay with 576 words and 49 facts (see Table III). Again, the two versions of *Britannica* are identical, and all four essays share nine facts. *DAH* shares nine additional facts with *Britannica* and six with *Wikipedia*, while *Wikipedia* and *Britannica* share two. *DAH* has 25 additional facts and

Source	Wikipedia	Dictionary of American History	New Encyclopaedia Britannica (print)	Encyclopaedia Britannica Online
Word count	372	576	316	316
Fact count	23	49	29	29
Fact matches	17	24	20	20
Additional facts	6	25	9	9
Unverifiable facts	0	0	0	0
Factual errors	2	0	0	0
Accuracy rate (percent)	91.3	100.0	100.0	100.0
Accuracy rate (excluding unverified facts, percent)	91.3	100.0	100.0	100.0
Images/media	1	0	0	0
Links	2	0	0	0
Bibliography	0	3	0	0
Author	N/A	Julienne L. Wood	N/A	N/A
"See also" references	0	2	0	0
Further reading	0	0	0	0

Table III.
Comparison of Free Soil
entries

discusses the origins of the party and its influence in politics in the years leading to the Civil War.

Wikipedia and *Britannica* are relatively equal in size (372 and 316 words, respectively) and number of facts (23 and 29). Only *Wikipedia* has a single fact error – the number of party representatives in Congress after the 1848 election. Additionally, *Wikipedia* contains a quote apparently from the party’s platform with no attribution.

Harper’s Ferry Raid

The *DAH* entry on the Harper’s Ferry Raid differ fundamentally from the other three articles in that it focuses only on John Brown’s 1859 attack on the arsenal in Harper’s Ferry, while *Wikipedia* and the two *Britannica* articles include both earlier and more recent history on the town and general geographic features (see Table IV). The research here only reviewed the sections of the latter three articles relating to Brown’s Harper’s Ferry raid. With that said, the *DAH* article is much lengthier (1,631 words) with many more facts (122). The article provides details of John Brown’s pursuits prior to the raid, explaining how his abolitionist efforts culminated in the attack. It describes the individual events of the raids and the actions of both Brown’s men and the militia and US Calvary. The *Wikipedia* and *Britannica* entries are much shorter, sharing a majority of their facts. Despite the disparity in length and depth of the two articles, the *Wikipedia* entry has only one fewer incorrect fact that *DAH* and has one more unverifiable fact. Still, the *Wikipedia* article has a rather long direct quote in the last paragraph of the John Brown section without attribution, and the one citation included in that section does not accurately reflect the original source (the *Wikipedia* entry lists a different date than the original).

The total article size is 1,659 words for *Wikipedia* and 432/549 for *Encyclopaedia Britannica/Britannica Online*.

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	234 ^a	1,631	184 ^a	190 ^a
Fact count	21 ^a	122	22 ^a	23 ^a
Fact matches	10	19	16	17
Additional facts	11	103	6	6
Unverifiable facts	5	4	0	0
Factual errors	3	5	0	0
Accuracy rate (percent)	61.9	92.6	100.0	100.0
Accuracy rate (excluding unverified facts)	81.3	95.8	100.0	100.0
Images/media	4	1	0	1
Links	17	0	0	0
Bibliography	1	3	0	0
Author	N/A	Timothy M. Roberts	N/A	N/A
“See also” references	0	2	0	0
Further reading	0	0	0	0

Table IV.
Comparison of Harper’s
Ferry entries

Note: ^aArticles include additional information about the larger history/description of the town

William Kidd

Of the four entries for William Kidd (pirate), *Wikipedia* is by far the longest article with 1,978 words specific to Kidd's biography. As one can see in Table V, although *Wikipedia* provides many more particular details about Kidd's pursuits, ships, crew members and bounty, both it and *DAH* include all major incidents leading to his trial and death. Many of these details in *Wikipedia* are either incorrect (14) or unverifiable (37) as compared to the four unverified facts in *DAH* and the three partially incorrect facts in the two *Britannicas*. For example, the *Wikipedia* article includes several details of Kidd's childhood that were not confirmed in three principal biographies (Harris, 2002; Ritchie, 1986; Zacks, 2002), and the essay suggests he turned to piracy before most of the biographers indicate. One paragraph of the essay references a children's book on Kidd, which may oversimplify the man's career. In addition, the *Wikipedia* entry includes 38 facts concerning references to Kidd in literature, music and popular culture that are not directly related to his life, but may be of interest to readers. Again, the two *Britannica* articles are considerably less detailed and comprehensive, with only 19 facts not mentioned in either of the other two entries.

The total word count of the *Wikipedia* entry is 2,415, with 38 additional facts.

Mexican-American War

Table VI illustrates the comparison of the entries on the Mexican-American War. *Wikipedia* has the longest article by far, more than five times as long as *Britannica* and more than three times as long as *DAH*. Each entry shares between 25 and 30 facts with one or the other (or both) source(s); *Wikipedia* has the most original facts and the most that are incorrect or unverifiable. After consulting 34 historical and biographical sources, this study found that *Britannica* has one unverifiable fact and one fact of questionable accuracy (there is slight disagreement among a number of sources –

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	1,978 ^a	1,151	486	501
Fact count	227 ^a	132		55
Fact matches	30	34		36
Additional facts	197	98		19
Unverifiable facts	37	4	0	0
Factual errors	14	0	3	3
Accuracy Rate (percent)	77.5	97.0	94.5	94.5
Accuracy rate (excluding unverified facts, percent)	92.6	100.0	94.5	94.5
Images/media	2	1	0	1
Links	189	0	0	0
Bibliography	4	2	0	0
Author	N/A	Robert C. Ritchie	N/A	N/A
"See also" references	3	0	0	0
Further reading	0	3	0	0

Note: ^a*Wikipedia* includes facts concerning references to William Kidd in popular culture (songs, movies, children's games, etc.) that are not included here

Table V.
Comparison of Kidd
entries

Table VI.
Comparison of
Mexican-American War
entries

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	4,448	1,341	769	811
Fact count	234	77	44	48
Fact matches	29	30	26	26
Additional facts	205	47	18	22
Unverifiable facts	14	1	1	1
Factual errors	40	2	1	1
Accuracy rate (percent)	76.9	96.1	95.5	95.8
Accuracy rate (excluding unverified facts, percent))	81.3	97.4	97.7	97.9
Images/media	1	4	0	2
Links	187	0	N/A	13
Bibliography	44	5	0	0
Author	N/A	J.M. Callahan	N/A	N/A
"See also" references	4	8	0	0
Further reading	0	0	0	0

Meed, 2003; Selby, n.d.; Bauer, 1974 – as to the proposed initial US offer to buy California and New Mexico). There are two minor inaccuracies in the *DAH* entry, related to battle dates, and one unverifiable fact. In *Wikipedia* ten facts are unverifiable, 12 facts are only partially correct or verifiable, and 28 facts are in direct dispute with other sources. This total does not include facts, such as number of casualties, which varied within a number of sources. Most of the inaccuracies are minor ones, such as incorrect dates or lengths of battles or size of military forces and number of casualties. In other cases, the inaccuracies are more problematic; in one case involving a skirmish at Dominquez Rancho, *Wikipedia* states that the Californios (or Mexicans) retreated, when actually the Americans retreated (Denger, n.d.). Furthermore, the sentence in *Wikipedia* is exactly the same as another source about a different California skirmish at Rancho Natividad (California State Military Museum, 2002), where the Californios did retreat.

But perhaps even more problematic, this entry in *Wikipedia* is written so that small skirmishes have more prominence than major battles (and some major battles were missing entirely), and readers may have difficulty determining the chronology of the war without reference to specific dates because the entry did not sequence events in chronological order. Unlike the other two samples evaluated, this entry obviously is written by multiple authors with little apparent concern for the overall flow and readability of the article. Unfortunately the citations, too, are very problematic. There are two footnotes each marked [1], [2] and [3], with only one each listed in the footnotes. Secondly, the footnote number [2] textually referenced the author of the second footnote [1]. The article includes six additional citations parenthetically in the entry; one of those cannot be verified.

The *DAH* entry seems to be the most comprehensive and accurate, even though the *Wikipedia* is longer and much more detailed. Although it does not provide the level of detail that *Wikipedia* did (77 facts as compared to 234), it offers an overview of the war that is proportional to most other historical accounts. It contains information on each of

the major military campaigns in the war as well as the diplomatic efforts made during the war. Furthermore, it offers a brief description of the events leading up to the war and the economic and political aftermath of the conflict.

Niagara Movement

The entries describing W.E.B. DuBois' Niagara movement are among the shortest; all of the articles are less than 500 words (see Table VII for details). Here the *DAH* is the longest at 470 and the most comprehensive with 55 facts, 39 of which are not mentioned elsewhere. Its depiction of the movement includes the first three conventions and the absorption of the movement into the larger NAACP. The new *Britannica* articles are identical and relatively brief, as is the *Wikipedia* entry. Although all of the entries are brief, there are still disputable facts; *Wikipedia* has the most with four unverifiable facts and three containing errors; *DAH* has three unverifiable statements and one statement containing errors, and *Britannica* has two factual errors.

Sand Creek

As one can see in Table VIII, the three entries (here again, the two *Britannicas* were identical) on Sand Creek and the Sand Creek Massacre in 1864 vary in length and number of facts. *Wikipedia's* entry is by far the longest, with 1,010 words on the origins, events and consequences of the massacre (not including references to the attack in music, film and literature). However, the *DAH* article contains a relatively large number of facts (two-thirds of *Wikipedia's* total) given the shorter length (43 percent of *Wikipedia's*). Furthermore, *Wikipedia* again has a much higher proportion of unverifiable (three) and factual errors (six) than does either *DAH* (two incorrect) or *Britannica* (one incorrect). Some of these include the actual location of the reservation where the Cheyenne agreed to settle and particular battalions of soldiers who participated (Greene and Scott, 2004; Greene, 2004; Hatch, 2004; Brown, 1971).

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	231	470	205	205
Fact count	25	55	19	19
Fact matches	11	16	11	11
Additional facts	14	39	8	8
Unverifiable facts	4	3	0	0
Factual errors	3	1	2	2
Accuracy rate (percent)	72.0	92.7	89.5	89.5
Accuracy rate (excluding unverified facts, percent)	85.7	98.1	89.5	89.5
Images/media	2	0	0	0
Links	21	0	0	0
Bibliography	0	3	0	0
Author	N/A	Jeremy Derfner	N/A	0
"See also" references	2	4	0	0
Further reading	0	0	0	0

Table VII.
Comparison of Niagara
Movement entries

Source	<i>Wikipedia</i>	<i>Dictionary of American History</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	1,010 ^a	441	151	151
Fact count	73 ^a	49	18	18
Fact matches	25	23	13	13
Additional facts	48	26	5	5
Unverifiable facts	3	0	0	0
Factual errors	6	2	1	1
Accuracy rate (percent)	87.7	95.9	94.4	94.4
Accuracy rate (excluding unverified facts, percent)	91.4	95.9	94.4	94.4
Images/media	2	1	0	0
Links	53	0	0	0
Bibliography	0	2	0	0
Author	N/A	Frederick E. Hoxie	N/A	N/A
"See also" references	0	0	0	0
Further reading	6	0	0	0

Table VIII.
Comparison of Sand
Creek Massacre entries

Note: ^a*Wikipedia* includes facts concerning references to Sand Creek in popular culture (songs, movies, literature, etc.) that are not included here. The total word count of the *Wikipedia* entry is 1,315, with 29 additional facts

Moreover, the *Wikipedia* entry includes a long quote apparently from the Joint Committee on the Conduct of the [Civil] War that is neither attributed nor fully verifiable.

Harriet Tubman

The four essays on Harriet Tubman vary considerably, and several facts here are unverifiable or incorrect. Table IX details the evaluation of the biographies. In total, 14 facts are shared by all four sources; *Britannica Online* (*BO*) and *American National Biography* (*ANB*) share nine, *BO* and *Wikipedia* share one, and *ANB* and *Wikipedia* share 12 facts. *Britannica* includes two otherwise unmentioned facts, *ANB* contains 35 unmatched facts and *Wikipedia* contains 30 additional facts.

The most complete and accurate entry is in *ANB* by Cornell history professor Margaret Washington (Cornell University, 2006); it is the longest with 1,375 words and contains the most facts about Tubman. Of its 70 facts, all except three of are verifiable; two events are confirmed but vary in terms of the age at which they occurred (Clinton, 2004; Quinn, 2003; Bradford, 1886).

Wikipedia's entry follows *ANB* in terms of length and comprehensiveness; it includes 67 facts. All except two are verifiable. Of the remaining 65, ten contain errors. Some of these are minor errors, such as year of birth and number of siblings; others are more significant, such as the number of rescue attempts she made and the number of slaves she helped escaped (Clinton, 2004).

Britannica (both print and online) are the shortest and least comprehensive entries with 300 words/19 facts and 385 words/26 facts, respectively. All of *Britannica*'s facts are verifiable, with only one factual error.

Source	<i>Wikipedia</i>	<i>American National Biography Online</i>	<i>New Encyclopaedia Britannica</i> (print)	<i>Encyclopaedia Britannica Online</i>
Word count	1,133	1,375	300	385
Fact count	58	70	19	26
Fact matches	27	35	19	24
Additional facts	31	35	0	2
Unverifiable facts	2	3	0	0
Factual errors	10	2	1	1
Accuracy rate (percent)	79.3	92.9	94.7	96.2
Accuracy rate (excluding unverified facts, percent)	82.1	97.0	94.7	96.2
Images/media	1	1	0	1
Links	28	11	N/A	4
Bibliography	3	5	0	0
Author	N/A	Margaret Washington	N/A	N/A
"See also" references	4	11	0	0
Further reading	4	2	0	1

Table IX.
Comparison of Tubman
entries

Discussion

Certainly this research is too limited in scope to make broad generalizations about the credibility and authority of *Wikipedia* entries. However, the study did reveal inaccuracies in eight of the nine entries and exposed major flaws in at least two of the nine *Wikipedia* articles. If one combined the number of facts listed for the nine entries within each source (seven for *DAH* and two for *ANB*) and compared them to the number of inaccuracies and unverifiable facts, *Britannica* has a 96 percent accuracy rate (96.5 percent excluding unverifiable facts), *DAH* and *ANB* combined have a 95 percent rate (97.5 percent excluding unverifiable facts), while *Wikipedia* has an 80 percent accuracy rate (88 percent excluding unverifiable facts). Similarly, the first two sources have a 99.6 percent and 97.3 percent verifiability rate, respectively, while *Wikipedia* has a 90.7 percent verifiability rate. Based on these nine articles it would seem that *Wikipedia* is less reliable than the other three sources.

Only the *Dictionary of American History* and *American National Biography* credit their entries. *Wikipedia* stands on the anonymity of authors, and *Britannica* failed to list authors as well. All except one of the essay authors are researchers in the particular area; many are renowned scholars with multiple publications on the topic. The author of the badlands essay is Doane Robinson, former state historian of South Dakota (WGBH, 2002). Andrew Rieser, the author of the Chautauqua piece, was an associate editor of the *DAH* (Gale, 2007) and a published author on the movement. Robert Ritchie, the author of the Kidd essay, is a pre-eminent Kidd biographer and Director of Research and Education at the Huntington Library (*American National Biography*, 2007).

Eight *Wikipedia* articles contain unattributed quotes and at least five cases of possibly plagiarized content (material found verbatim elsewhere). The researcher found these cases easily without intense scrutiny; more text may have been copied.

This lack of attribution is of serious concern; without an evaluation process or peer review, plagiarized content on *Wikipedia* may go unchecked.

This analysis shows reason to continue to measure and compare *Wikipedia* entries to those of authoritative references sources in history and a variety of other academic disciplines. This comparison is particularly necessary for larger, more comprehensive entries with longer and more detailed histories.

Another issue that this study revealed is the difference in writing quality and point of view in the various sources. The shorter entries in *Wikipedia* are well written and seem to flow seamlessly as if written by one or few writers, but longer entries, particularly the Mexican-American War article, are disjointed and show variation in voice from the numerous contributors. While it is important to include different perspectives on historical places, people and events, these entries should exhibit consistent voice, literary flow and cohesiveness. The writing quality of *Wikipedia* entries appears to vary greatly on this point. Furthermore, some of the sources *Wikipedia* uses (when mentioned) may be outdated or lack credibility themselves. For example, the Kidd essay references a juvenile biography, which may provide an overly simplistic treatment of the man.

One area of further study may be to examine and evaluate *Wikipedia's* histories themselves. In the brief review of the more detailed history of the Mexican-American War, for instance, this study found that references were deleted and correct facts were modified incorrectly. Also, it would appear that some inaccuracies may have been typing errors. A more detailed study of individual histories may lead to deeper analysis as to the nature of *Wikipedia's* contributors.

While *Wikipedia* provides a wealth of information and is a model for non-proprietary peer-production of reference materials, it does not fare as favorably as do other reference resources under scrutiny for accuracy, comprehensiveness and reliability. Academics may question students' or colleagues' use of *Wikipedia* as a scholarly resource. Certainly, the lack of attribution should be of great concern to scholars and Wikipedians alike. Research is needed in other disciplines comparing *Wikipedia* against trusted reference sources to further evaluate its reliability and value.

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See Who's Editing Wikipedia - Diebold, the CIA, a Campaign

WIRED Magazine | August 14, 2007

By John Borland

On November 17th, 2005, an anonymous Wikipedia user deleted 15 paragraphs from an article on e-voting machine-vendor Diebold, excising an entire section critical of the company's machines. While anonymous, such changes typically leave behind digital fingerprints offering hints about the contributor, such as the location of the computer used to make the edits.

In this case, the changes came from an IP address reserved for the corporate offices of Diebold itself. And it is far from an isolated case. A new data-mining service launched Monday traces millions of Wikipedia entries to their corporate sources, and for the first time puts comprehensive data behind longstanding suspicions of manipulation, which until now have surfaced only piecemeal in investigations of specific allegations.

Wikipedia Scanner -- the brainchild of Cal Tech computation and neural-systems graduate student Virgil Griffith -- offers users a searchable database that ties millions of anonymous Wikipedia edits to organizations where those edits apparently originated, by cross-referencing the edits with data on who owns the associated block of internet IP addresses.

Inspired by news last year that Congress members' offices had been editing their own entries, Griffith says he got curious, and wanted to know whether big companies and other organizations were doing things in a similarly self-interested vein.

"Everything's better if you do it on a huge scale, and automate it," he says with a grin.

This database is possible thanks to a combination of Wikipedia policies and (mostly) publicly available information.

The online encyclopedia allows anyone to make edits, but keeps detailed logs of all these changes. Users who are logged in are tracked only by their user name, but anonymous changes leave a public record of their IP address.

The organization also allows downloads of the complete Wikipedia, including records of all these changes.

Griffith thus downloaded the entire encyclopedia, isolating the XML-based records of anonymous changes and IP addresses. He then correlated those IP addresses with public net-address lookup services such as ARIN, as well as private domain-name data provided by

IP2Location.com.

The result: A database of 34.4 million edits, performed by 2.6 million organizations or individuals ranging from the CIA to Microsoft to Congressional offices, now linked to the edits they or someone at their organization's net address has made.

Some of this appears to be transparently self-interested, either adding positive, press release-like material to entries, or deleting whole swaths of critical material.

Voting-machine company Diebold provides a good example of the latter, with someone at the company's IP address apparently deleting long paragraphs detailing the security industry's concerns over the integrity of their voting machines, and information about the company's CEO's fund-raising for President Bush.

The text, deleted in November 2005, was quickly restored by another Wikipedia contributor, who advised the anonymous editor, "Please stop removing content from Wikipedia. It is considered vandalism."

A Diebold Election Systems spokesman said he'd look into the matter but could not comment by press time.

Wal-Mart has a series of relatively small changes in 2005 that that burnish the company's image on its own entry while often leaving criticism in, changing a line that its wages are less than other retail stores to a note that it pays nearly double the minimum wage, for example. Another leaves activist criticism on community impact intact, while citing a "definitive" study showing Wal-Mart raised the total number of jobs in a community.

As has been previously reported, politician's offices are heavy users of the system. Former Montana Sen. Conrad Burns' office, for example, apparently changed one critical paragraph headed "A controversial voice" to "A voice for farmers," with predictably image-friendly content following it.

Perhaps interestingly, many of the most apparently self-interested changes come from before 2006, when news of the Congressional offices' edits reached the headlines. This may indicate a growing sophistication with the workings of Wikipedia over time, or even the rise of corporate Wikipedia policies.

Wikipedia founder Jimmy Wales told Wired News he was aware of the new service, but needed time to experiment with it before commenting.

The vast majority of changes are fairly innocuous, however. Employees at the CIA's net address, for example, have been busy -- but with little that would indicate their place of apparent employment, or a particular bias.

One entry on "Black September in Jordan" contains wholesale additions, with specific details that read like a popular history book or an eyewitness' memoir.

Many more are simple copy edits, or additions to local town entries or school histories. One CIA entry deals with the details of lyrics sung in a Buffy the Vampire Slayer episode.

Griffith says he launched the project hoping to find scandals, particularly at obvious targets such as companies like Halliburton. But there's a more practical goal, too: By exposing the anonymous edits that companies such as drugs and big pharmaceutical companies make in entries that affect their businesses, it could help experts check up on the changes and make sure they're accurate, he says.

For now, he has just scratched the surface of the database of millions of entries. But he's putting it online so others can look too.

The nonprofit Wikimedia Foundation, which runs Wikipedia, did not respond to e-mail and telephone inquiries Monday.



Wikipedia Editor Out After False Credentials Revealed

Thursday , March 08, 2007

By James Doran

THE TIMES

NEW YORK —

Wikipedia, the controversial online encyclopedia, is planning to ask its army of faceless Internet editors — known as Wikipedians — to verify their credentials after one of the most prolific of their number was exposed as a fraud.

The online reference work was dealt a serious blow last week as it emerged that EssJay, a Wikipedia editor understood by the site and its users to be a tenured professor of religion at a private university with expertise in canon law, was in fact a 24-year-old from Kentucky called Ryan Jordan with no higher educational qualifications to speak of.

What is more, Mr. Jordan's expertise and dedication to the site seemed so great that he was given a full-time job at another company run by Jimmy Wales, the Wikipedia founder.

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After initially ignoring the problem, Mr. Wales has since asked Mr. Jordan to resign from Wikia, the Internet company he controls, and has removed him from the Wikipedia Web site.

Wikipedia has come under fire from all sides amid claims that much of its content is unreliable and prone to Internet vandals who deliberately print false information on the Web site.

The EssJay affair, which has enraged critics and supporters of Wikipedia in equal measure, is the most serious instance of fraud experienced by the Web site so far.

The Wikipedia founder was in Japan when the EssJay fraud was exposed in the U.S.

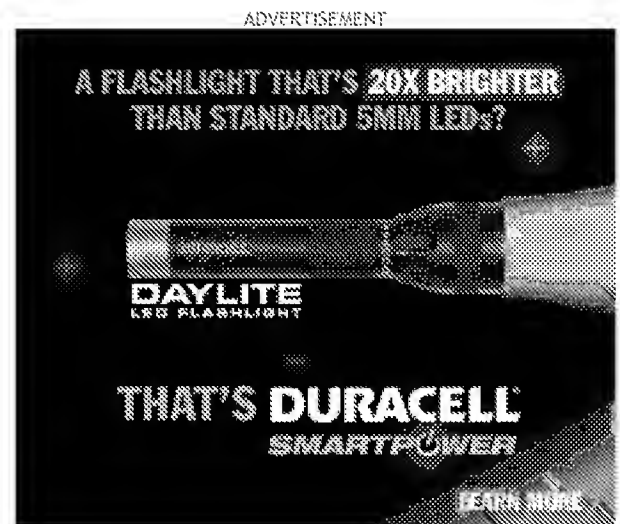
Mr. Wales said the site and its users will soon devise a scheme to adequately check credentials of those Wikipedia editors who claim to possess them.

But Wikipedia, by its nature, is self-policing and its experts are not required to have credentials, so a valid check will be hard to implement.

"I don't think this incident exposes any inherent weakness in Wikipedia, but it does expose a weakness that we will be working to address," Mr. Wales said. "The only thing inherent in the Wikipedia model is a volunteer effort to create the highest possible quality encyclopedia."

Mr. Wales told The Times that he is "personally saddened" by the identity fraud in one of his most trusted editors, and confessed that he did not take the issue as seriously as he should have done.

Mr. Wales first thought Mr. Jordan was merely using a false identity to protect himself from online cranks and maintains that his 20,000 or more entries in the Wikipedia have never been called into question.



"He got himself into this years ago, and kept it up because he saw no way out," the Wikipedia founder said. "He started his deception before we became friends, and I was not particularly aware of his alleged credentials. I know him as an excellent editor."

Mr. Wales admitted that Wikipedia users and editors alike operate using a much higher degree of trust than many in the real world find unusual, but that the Wiki model had weeded out a falsehood in the end.

"Mr. Ryan was a friend, and still is a friend," the Wikipedia founder said. "He is a young man, and he has offered me a heartfelt personal apology, which I have accepted. I hope the world will let him go in peace to build an honorable life and reputation."

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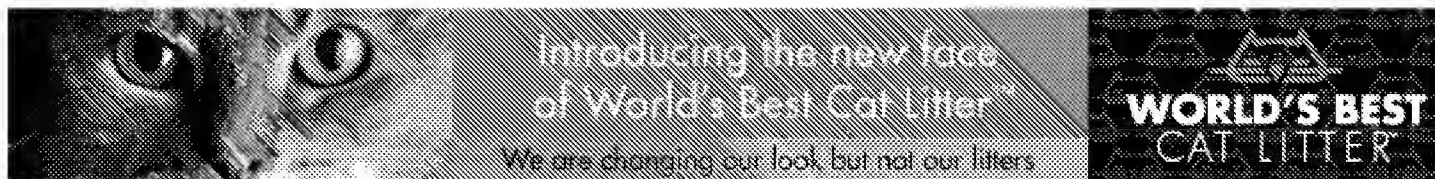
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Powered I

A false Wikipedia 'biography'

By John Seigenthaler

"John Seigenthaler Sr. was the assistant to Attorney General Robert Kennedy in the early 1960's. For a brief time, he was thought to have been directly involved in the Kennedy assassinations of both John, and his brother, Bobby. Nothing was ever proven."

— Wikipedia

This is a highly personal story about Internet character assassination. It could be your story.

I have no idea whose sick mind conceived the false, malicious "biography" that appeared under my name for 132 days on Wikipedia, the popular, online, free encyclopedia whose authors are unknown and virtually untraceable. There was more:

"John Seigenthaler moved to the Soviet Union in 1971, and returned to the United States in 1984," Wikipedia said. "He started one of the country's largest public relations firms shortly thereafter."

At age 78, I thought I was beyond surprise or hurt at anything negative said about me. I was wrong. One sentence in the biography was true. I was Robert Kennedy's administrative assistant in the early 1960s. I also was his pallbearer. It was mind-boggling when my son, John Seigenthaler, journalist with NBC News, phoned later to say he found the same scurrilous text on Reference.com and Answers.com.

I had heard for weeks from teachers, journalists and historians about "the wonderful world of Wikipedia," where millions of people worldwide visit daily for quick reference "facts," composed and posted by people with no special expertise or knowledge — and sometimes by people with malice.

At my request, executives of the three websites now have removed the false content about me. But they don't know, and can't find out, who wrote the toxic sentences.

Anonymous author

I phoned Jimmy Wales, Wikipedia's founder and asked, "Do you ... have any way to know who wrote that?"

"No, we don't," he said. Representatives of the other two websites said their computers are programmed to copy data verbatim from Wikipedia, never checking whether it is false or factual.

Naturally, I want to unmask my "biographer." And, I am interested in letting many people know that Wikipedia is a flawed and irresponsible research tool.

But searching cyberspace for the identity of people who post spurious information can be frustrating. I found on Wikipedia the registered IP (Internet Protocol) number of my "biographer"-



65-81-97-208. I traced it to a customer of BellSouth Internet. That company advertises a phone number to report "Abuse Issues." An electronic voice said all complaints must be e-mailed. My two e-mails were answered by identical form letters, advising me that the company would conduct an investigation but might not tell me the results. It was signed "Abuse Team."

Wales, Wikipedia's founder, told me that BellSouth would not be helpful. "We have trouble with people posting abusive things over and over and over," he said. "We block their IP numbers, and they sneak in another way. So we contact the service providers, and they are not very responsive."

After three weeks, hearing nothing further about the Abuse Team investigation, I phoned BellSouth's Atlanta corporate headquarters, which led to conversations between my lawyer and BellSouth's counsel. My only remote chance of getting the name, I learned, was to file a "John or Jane Doe" lawsuit against my "biographer." Major communications Internet companies are bound by federal privacy laws that protect the identity of their customers, even those who defame online. Only if a lawsuit resulted in a court subpoena would BellSouth give up the name.

Little legal recourse

Federal law also protects online corporations — BellSouth, AOL, MCI Wikipedia, etc. — from libel lawsuits. Section 230 of the Communications Decency Act, passed in 1996, specifically states that "no provider or user of an interactive computer service shall be treated as the publisher or speaker." That legalese means that, unlike print and broadcast companies, online service providers cannot be sued for disseminating defamatory attacks on citizens posted by others.

Recent low-profile court decisions document that Congress effectively has barred defamation in cyberspace. Wikipedia's website acknowledges that it is not responsible for inaccurate information, but Wales, in a recent C-Span interview with Brian Lamb, insisted that his website is accountable and that his community of thousands of volunteer editors (he said he has only one paid employee) corrects mistakes within minutes.

My experience refutes that. My "biography" was posted May 26. On May 29, one of Wales' volunteers "edited" it only by correcting the misspelling of the word "early." For four months, Wikipedia depicted me as a suspected assassin before Wales erased it from his website's history Oct. 5. The falsehoods remained on Answers.com and Reference.com for three more weeks.

In the C-Span interview, Wales said Wikipedia has "millions" of daily global visitors and is one of the world's busiest websites. His volunteer community runs the Wikipedia operation, he said. He funds his website through a non-profit foundation and estimated a 2006 budget of "about a million dollars."

And so we live in a universe of new media with phenomenal opportunities for worldwide communications and research — but populated by volunteer vandals with poison-pen intellects. Congress has enabled them and protects them.

When I was a child, my mother lectured me on the evils of "gossip." She held a feather pillow and said, "If I tear this open, the feathers will fly to the four winds, and I could never get them back in the pillow. That's how it is when you spread mean things about people."

For me, that pillow is a metaphor for Wikipedia.

John Seigenthaler, a retired journalist, founded The Freedom Forum First Amendment Center at Vanderbilt University. He also is a former editorial page editor at USA TODAY.

Find this article at:

http://www.usatoday.com/news/opinion/editorials/2005-11-29-wikipedia-edit_x.htm



LEXSEE 415 F.3D 1303

**EDWARD H. PHILLIPS, Plaintiff-Appellant, v. AWH CORPORATION,
HOPEMAN BROTHERS, INC., and LOFTON CORPORATION, Defendants-Cross
Appellants.**

03-1269, -1286

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

415 F.3d 1303; 2005 U.S. App. LEXIS 13954; 75 U.S.P.Q.2D (BNA) 1321

July 12, 2005, Decided

SUBSEQUENT HISTORY: As Amended July 14, 2005.

US Supreme Court certiorari denied by AWH Corp. v. Phillips, 126 S. Ct. 1332, 164 L. Ed. 2d 49, 2006 U.S. LEXIS 1154 (U.S., 2006)

Injunction granted at, Judgment entered by, Motion denied by, Motion for new trial denied by, Motion to strike denied by Phillips v. AWH Corp., 2006 U.S. Dist. LEXIS 92891 (D. Colo., Dec. 20, 2006)

PRIOR HISTORY: **[**1]** Appealed from: United States District Court for the District of Colorado. Judge Marcia S. Krieger.

Phillips v. AWH Corp., 2003 U.S. Dist. LEXIS 25199 (D. Colo., Jan. 21, 2003)

DISPOSITION: Affirmed in part, reversed in part, dismissed in part, and remanded.

COUNSEL: Carl F. Manthei, Attorney at Law, of Boulder, Colorado, argued for plaintiff-appellant.

Mark W. Fischer, Faegre & Benson LLP, of Boulder, Colorado, argued for defendants-cross appellants. With him on the brief were Neal S. Cohen and Peter J. Kinsella. Of counsel on the brief were Maurice M. Klee, Law Office of Maurice M. Klee, Ph.D., Fairfield, Connecticut, and Kenneth C. Bass, III, Sterne, Kessler, Goldstein & Fox, of Washington, DC. Of counsel was Scott E. Holwick, Faegre & Benson LLP.

John M. Whealan, Solicitor, United States Patent and Trademark Office, of Alexandria, Virginia, argued for amicus curiae United States. With him on the brief were James A. Toupin, General Counsel; Cynthia C. Lynch; Linda Moncys Isacson; and Thomas W. Krause, Associate Solicitors. Of counsel on the brief were Peter D. Keisler, Assistant Attorney General; John J. Fargo, Director, Commercial Litigation Branch, and Anthony J. Steinmeyer, Attorney, Appellate Staff, Civil Division, United States Department of Justice, of Washington, **[**2]** DC; and William E. Kovacic, General Counsel, and Suzanne T. Michel, Chief Counsel for Intellectual Property, Federal Trade Commission, of Washington, DC.

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JUDGES: Before MICHEL, Chief Judge, NEWMAN, MAYER, LOURIE, CLEVINGER, RADER, SCHALL, BRYSON, GAJARSA, LINN, DYK, and PROST, Circuit Judges. Opinion for the court filed by Circuit Judge BRYSON, in which Chief Judge MICHEL and Circuit Judges CLEVINGER, RADER, SCHALL, GAJARSA, LINN, DYK, and PROST join; and in which Circuit

Judge LOURIE joins with respect to parts I, II, III, V, and VI; and in which Circuit Judge NEWMAN joins with respect to parts I, II, III, and V. Opinion concurring in part and dissenting in part filed by Circuit Judge LOURIE, in which [**10] Circuit Judge NEWMAN joins. Dissenting opinion filed by Circuit Judge MAYER, in which Circuit Judge NEWMAN joins.

OPINION BY: BRYSON

OPINION

[*1309] BRYSON, Circuit Judge.

Edward H. Phillips invented modular, steel-shell panels that can be welded together to form vandalism-resistant walls. The panels are especially useful in building prisons because they are load-bearing and impact-resistant, while also insulating against fire and noise. Mr. Phillips obtained a patent on the invention, U.S. Patent No. 4,677,798 ("the '798 patent"), and he subsequently entered into an arrangement with AWH Corporation, Hopeman Brothers, Inc., and Lofton Corporation (collectively "AWH") to market and sell the panels. That arrangement ended in 1990. In 1991, however, Mr. Phillips received a sales brochure from AWH that suggested to him that AWH was continuing to use his trade secrets and patented technology without his consent. In a series of letters in 1991 and 1992, Mr. Phillips accused AWH of patent infringement and trade secret misappropriation. Correspondence between the parties regarding the matter ceased after that time.

In February 1997, Mr. Phillips brought suit in the United States District Court for [**11] the District of Colorado charging AWH with misappropriation of trade secrets and infringement of claims 1, 21, 22, 24, 25, and 26 of the '798 patent. Phillips v. AWH Corp., No. 97-N-212 (D. Colo.). The district court dismissed the trade secret misappropriation claim as barred by Colorado's three-year statute of limitations.

With regard to the patent infringement issue, the district court focused on the language of claim 1, which recites "further means disposed inside the shell for increasing its load bearing capacity comprising internal steel baffles extending inwardly from the steel shell walls." The court interpreted that language as "a means . . . for performing a specified function," subject to 35 U.S.C. § 112, paragraph 6, which provides that such a claim "shall be construed to cover the corresponding

structure, material, or acts described in the specification and equivalents thereof." Looking to the specification of the '798 patent, the court noted that "every textual reference in the Specification and its diagrams show baffle deployment at an angle other than 90 [degree] to the wall faces" and that "placement of the baffles at such angles creates [**12] an intermediate interlocking, but not solid, internal barrier." The district court therefore ruled that, for purposes of the '798 patent, a baffle must "extend inward from the steel shell walls at an oblique or acute angle to the wall face" and must form part of an interlocking barrier in the interior of the wall module. Because Mr. Phillips could not prove infringement under that claim construction, the district court granted summary judgment of noninfringement.

Mr. Phillips appealed with respect to both the trade secret and patent infringement claims. A panel of this court affirmed on both issues. Phillips v. AWH Corp., 363 F.3d 1207 (Fed. Cir. 2004). As to the trade secret claim, the panel unanimously upheld the district court's ruling that the claim was barred by the applicable statute of limitations. Id. at 1215. As to the patent infringement claims, the panel was divided. The majority sustained the district court's summary judgment of noninfringement, although on different grounds. The dissenting judge would have reversed the summary judgment of noninfringement.

[*1310] The panel first determined that because the asserted claims of the '798 patent [**13] contain a sufficient recitation of structure, the district court erred by construing the term "baffles" to invoke the "means-plus-function" claim format authorized by section 112, paragraph 6. Id. at 1212. Nonetheless, the panel concluded that the patent uses the term "baffles" in a restrictive manner. Based on the patent's written description, the panel held that the claim term "baffles" excludes structures that extend at a 90 degree angle from the walls. The panel noted that the specification repeatedly refers to the ability of the claimed baffles to deflect projectiles and that it describes the baffles as being "disposed at such angles that bullets which might penetrate the outer steel panels are deflected." '798 patent, col. 2, ll. 13-15; see also id. at col. 5, ll. 17-19 (baffles are "disposed at angles which tend to deflect the bullets"). In addition, the panel observed that nowhere in the patent is there any disclosure of a baffle projecting from the wall at a right angle and that baffles oriented at 90 degrees to the wall were found in the prior art. Based

on "the specification's explicit descriptions," the panel concluded "that the patentee regarded his [*14] invention as panels providing impact or projectile resistance and that the baffles must be oriented at angles other than 90 [degree]." Phillips, 363 F.3d at 1213. The panel added that the patent specification "is intended to support and inform the claims, and here it makes it unmistakably clear that the invention involves baffles angled at other than 90 [degree]." Id. at 1214. The panel therefore upheld the district court's summary judgment of noninfringement.

The dissenting judge argued that the panel had improperly limited the claims to the particular embodiment of the invention disclosed in the specification, rather than adopting the "plain meaning" of the term "baffles." The dissenting judge noted that the parties had stipulated that "baffles" are a "means for obstructing, impeding, or checking the flow of something," and that the panel majority had agreed that the ordinary meaning of baffles is "something for deflecting, checking, or otherwise regulating flow." Phillips, 363 F.3d at 1216-17. In the dissent's view, nothing in the specification redefined the term "baffles" or constituted a disclaimer specifically limiting the [*15] term to less than the full scope of its ordinary meaning. Instead, the dissenting judge contended, the specification "merely identifies impact resistance as one of several objectives of the invention." Id. at 1217. In sum, the dissent concluded that "there is no reason to supplement the plain meaning of the claim language with a limitation from the preferred embodiment." Id. at 1218. Consequently, the dissenting judge argued that the court should have adopted the general purpose dictionary definition of the term baffle, i.e., "something for deflecting, checking, or otherwise regulating flow," id., and therefore should have reversed the summary judgment of noninfringement.

This court agreed to rehear the appeal en banc and vacated the judgment of the panel. Phillips v. AWH Corp., 376 F.3d 1382 (Fed. Cir. 2004). We now affirm the portion of the district court's judgment addressed to the trade secret misappropriation claims. However, we reverse the portion of the court's judgment addressed to the issue of infringement.

I

Claim 1 of the '798 patent is representative of the asserted claims with respect to the use of the term

"baffles. [*16] " It recites:

Building modules adapted to fit together for construction of fire, sound and impact resistant security barriers and rooms for use in securing records and [*1311] persons, comprising in combination, an outer shell . . . , sealant means . . . and further means disposed inside the shell for increasing its load bearing capacity comprising internal steel baffles extending inwardly from the steel shell walls.

As a preliminary matter, we agree with the panel that the term "baffles" is not means-plus-function language that invokes 35 U.S.C. § 112, paragraph 6. To be sure, the claim refers to "means disposed inside the shell for increasing its load bearing capacity," a formulation that would ordinarily be regarded as invoking the means-plus-function claim format. However, the claim specifically identifies "internal steel baffles" as structure that performs the recited function of increasing the shell's load-bearing capacity. In contrast to the "load bearing means" limitation, the reference to "baffles" does not use the word "means," and we have held that the absence of that term creates a rebuttable presumption that section 112, paragraph 6, does not [*17] apply. See Personalized Media Communs., LLC v. ITC, 161 F.3d 696, 703-04 (Fed. Cir. 1998).

Means-plus-function claiming applies only to purely functional limitations that do not provide the structure that performs the recited function. See Watts v. XL Sys., Inc., 232 F.3d 877, 880-81 (Fed. Cir. 2000). While the baffles in the '798 patent are clearly intended to perform several functions, the term "baffles" is nonetheless structural; it is not a purely functional placeholder in which structure is filled in by the specification. See TurboCare Div. of Demag Delaval Turbomachinery Corp. v. GE, 264 F.3d 1111, 1121 (Fed. Cir. 2001) (reasoning that nothing in the specification or prosecution history suggests that the patentee used the term "compressed spring" to denote any structure that is capable of performing the specified function); Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583 (Fed. Cir. 1996) (construing the term "detent mechanism" to refer to particular structure, even though the term has functional connotations). The claims and the specification unmistakably establish [*18] that the "steel baffles"

refer to particular physical apparatus. The claim characterizes the baffles as "extending inwardly" from the steel shell walls, which plainly implies that the baffles are structures. The specification likewise makes clear that the term "steel baffles" refers to particular internal wall structures and is not simply a general description of any structure that will perform a particular function. See, e.g., '798 patent, col. 4, ll. 25-26 ("the load bearing baffles 16 are optionally used with longer panels"); *id.*, col. 4, ll. 49-50 (opposing panels are "compressed between the flange 35 and the baffle 26"). Because the term "baffles" is not subject to section 112, paragraph 6, we agree with the panel that the district court erred by limiting the term to corresponding structures disclosed in the specification and their equivalents. Accordingly, we must determine the correct construction of the structural term "baffles," as used in the '798 patent.

II

The first paragraph of section 112 of the Patent Act, 35 U.S.C. § 112, states that the specification

shall contain a written description of the invention, and of the manner and [*19] process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same

The second paragraph of section 112 provides that the specification

shall conclude with one or more claims particularly pointing out and distinctly [*1312] claiming the subject matter which the applicant regards as his invention.

Those two paragraphs of section 112 frame the issue of claim interpretation for us. The second paragraph requires us to look to the language of the claims to determine what "the applicant regards as his invention." On the other hand, the first paragraph requires that the specification describe the invention set forth in the claims. The principal question that this case presents to us is the extent to which we should resort to and rely on a patent's specification in seeking to ascertain the proper scope of its claims.

This is hardly a new question. The role of the

specification in claim construction has been an issue in patent law decisions in this country for nearly two centuries. We addressed the relationship between the specification and the claims at some length [**20] in our en banc opinion in *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979-81 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996). We again summarized the applicable principles in *Vitronics Corp. v. Conceptor, Inc.*, 90 F.3d 1576 (Fed. Cir. 1996), and more recently in *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111 (Fed. Cir. 2004). What we said in those cases bears restating, for the basic principles of claim construction outlined there are still applicable, and we reaffirm them today. We have also previously considered the use of dictionaries in claim construction. What we have said in that regard requires clarification.

A

It is a "bedrock principle" of patent law that "the claims of a patent define the invention to which the patentee is entitled the right to exclude." *Innova*, 381 F.3d at 1115; see also *Vitronics*, 90 F.3d at 1582 ("we look to the words of the claims themselves . . . to define the scope of the patented invention"); *Markman*, 52 F.3d at 980 ("The written description part of the specification [**21] itself does not delimit the right to exclude. That is the function and purpose of claims."). That principle has been recognized since at least 1836, when Congress first required that the specification include a portion in which the inventor "shall particularly specify and point out the part, improvement, or combination, which he claims as his own invention or discovery." Act of July 4, 1836, ch. 357, § 6, 5 Stat. 117, 119. In the following years, the Supreme Court made clear that the claims are "of primary importance, in the effort to ascertain precisely what it is that is patented." *Merrill v. Yeomans*, 94 U.S. 568, 570, 24 L. Ed. 235, 1877 Dec. Comm'r Pat. 279 (1876). Because the patentee is required to "define precisely what his invention is," the Court explained, it is "unjust to the public, as well as an evasion of the law, to construe it in a manner different from the plain import of its terms." *White v. Dunbar*, 119 U.S. 47, 52, 30 L. Ed. 303, 7 S. Ct. 72, 1886 Dec. Comm'r Pat. 494 (1886); see also *Cont'l Paper Bag Co. v. E. Paper Bag Co.*, 210 U.S. 405, 419, 52 L. Ed. 1122, 28 S. Ct. 748, 1908 Dec. Comm'r Pat. 594 (1908) ("the claims measure the invention"); *McCarty v. Lehigh Valley R.R. Co.*, 160 U.S. 110, 116, 40 L. Ed. 358, 16 S. Ct. 240, 1895 Dec. Comm'r Pat. 721

(1895) [**22] ("if we once begin to include elements not mentioned in the claim, in order to limit such claim . . . , we should never know where to stop"); *Aro Mfg. Co. v. Convertible Top Replacement Co.*, 365 U.S. 336, 339, 5 L. Ed. 2d 592, 81 S. Ct. 599, 1961 Dec. Comm'r Pat. 635 (1961) ("the claims made in the patent are the sole measure of the grant").

We have frequently stated that the words of a claim "are generally given their ordinary and customary meaning." *Vitronics*, 90 F.3d at 1582; see also *Toro Co. v. White Consol. Indus., Inc.*, 199 F.3d 1295, 1299 (Fed. Cir. 1999); *Renishaw PLC [*1313] v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998). We have made clear, moreover, that the ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application. See *Innova*, 381 F.3d at 1116 ("A court construing a patent claim seeks to accord a claim the meaning it would have to a person of ordinary skill in the art at the time of the invention."); *Home Diagnostics, Inc. v. LifeScan, Inc.*, 381 F.3d 1352, 1358 (Fed. Cir. 2004) [**23] ("customary meaning" refers to the "customary meaning in [the] art field"); *Ferguson Beauregard/Logic Controls v. Mega Sys., LLC*, 350 F.3d 1327, 1338 (Fed. Cir. 2003) (claim terms "are examined through the viewing glass of a person skilled in the art"); see also *PC Connector Solutions LLC v. SmartDisk Corp.*, 406 F.3d 1359, 1363 (Fed. Cir. 2005) (meaning of claim "must be interpreted as of [the] effective filing date" of the patent application); *Schering Corp. v. Amgen Inc.*, 222 F.3d 1347, 1353 (Fed. Cir. 2000) (same).

The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation. See *Innova*, 381 F.3d at 1116. That starting point is based on the well-settled understanding that inventors are typically persons skilled in the field of the invention and that patents are addressed to and intended to be read by others of skill in the pertinent art. See *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1119 (Fed. Cir. 2002) (patent documents are meant to be "a concise statement for persons in the field"); [**24] *In re Nelson*, 47 C.C.P.A. 1031, 280 F.2d 172, 181, 1960 Dec. Comm'r Pat. 369 (CCPA 1960) ("The descriptions in patents are not addressed to the public generally, to lawyers or to judges, but, as section 112 says, to those skilled in the art to

which the invention pertains or with which it is most nearly connected.").

Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification. This court explained that point well in *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998):

It is the person of ordinary skill in the field of the invention through whose eyes the claims are construed. Such person is deemed to read the words used in the patent documents with an understanding of their meaning in the field, and to have knowledge of any special meaning and usage in the field. The inventor's words that are used to describe the invention--the inventor's lexicography--must be understood and interpreted by the court as they would be understood and interpreted by a person in that field [**25] of technology. Thus the court starts the decisionmaking process by reviewing the same resources as would that person, viz., the patent specification and the prosecution history.

See also *Medrad, Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1319 (Fed. Cir. 2005) ("We cannot look at the ordinary meaning of the term . . . in a vacuum. Rather, we must look at the ordinary meaning in the context of the written description and the prosecution history."); *V-Formation, Inc. v. Benetton Group SpA*, 401 F.3d 1307, 1310 (Fed. Cir. 2005) (intrinsic record "usually provides the technological and temporal context to enable the court to ascertain the meaning of the claim to one of ordinary skill in the art at the time of the invention"); *Unitherm Food Sys., Inc. v. Swift-Eckrich, Inc.*, 375 F.3d 1341, 1351 [*1314] (Fed. Cir. 2004) (proper definition is the "definition that one of ordinary skill in the art could ascertain from the intrinsic evidence in the record").

B

In some cases, the ordinary meaning of claim language as understood by a person of skill in the art may be readily apparent even to lay judges, and claim

construction in such cases [**26] involves little more than the application of the widely accepted meaning of commonly understood words. See *Brown v. 3M*, 265 F.3d 1349, 1352 (Fed. Cir. 2001) (holding that the claims did "not require elaborate interpretation"). In such circumstances, general purpose dictionaries may be helpful. In many cases that give rise to litigation, however, determining the ordinary and customary meaning of the claim requires examination of terms that have a particular meaning in a field of art. Because the meaning of a claim term as understood by persons of skill in the art is often not immediately apparent, and because patentees frequently use terms idiosyncratically, the court looks to "those sources available to the public that show what a person of skill in the art would have understood disputed claim language to mean." *Innova*, 381 F.3d at 1116. Those sources include "the words of the claims themselves, the remainder of the specification, the prosecution history, and extrinsic evidence concerning relevant scientific principles, the meaning of technical terms, and the state of the art." *Id.*; see also *Gemstar-TV Guide Int'l, Inc. v. ITC*, 383 F.3d 1352, 1364 (Fed. Cir. 2004); [**27] *Vitronics*, 90 F.3d at 1582-83; *Markman*, 52 F.3d at 979-80.

I

Quite apart from the written description and the prosecution history, the claims themselves provide substantial guidance as to the meaning of particular claim terms. See *Vitronics*, 90 F.3d at 1582; see also *ACTV, Inc. v. Walt Disney Co.*, 346 F.3d 1082, 1088 (Fed. Cir. 2003) ("the context of the surrounding words of the claim also must be considered in determining the ordinary and customary meaning of those terms").

To begin with, the context in which a term is used in the asserted claim can be highly instructive. To take a simple example, the claim in this case refers to "steel baffles," which strongly implies that the term "baffles" does not inherently mean objects made of steel. This court's cases provide numerous similar examples in which the use of a term within the claim provides a firm basis for construing the term. See, e.g., *Mars, Inc. v. H.J. Heinz Co.*, 377 F.3d 1369, 1374 (Fed. Cir. 2004) (claim term "ingredients" construed in light of the use of the term "mixture" in the same claim phrase); *Process Control Corp. v. HydReclaim Corp.*, 190 F.3d 1350, 1356 (Fed. Cir. 1999) [**28] (claim term "discharge rate" construed in light of the use of the same term in another

limitation of the same claim).

Other claims of the patent in question, both asserted and unasserted, can also be valuable sources of enlightenment as to the meaning of a claim term. *Vitronics*, 90 F.3d at 1582. Because claim terms are normally used consistently throughout the patent, the usage of a term in one claim can often illuminate the meaning of the same term in other claims. See *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001); *CVI/Beta Ventures, Inc. v. Tura LP*, 112 F.3d 1146, 1159 (Fed. Cir. 1997). Differences among claims can also be a useful guide in understanding the meaning of particular claim terms. See *Laitram Corp. v. Rexnord, Inc.*, 939 F.2d 1533, 1538 (Fed. Cir. 1991). For example, [**1315] the presence of a dependent claim that adds a particular limitation gives rise to a presumption that the limitation in question is not present in the independent claim. See *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 910 (Fed. Cir. 2004).

2

The claims, of course, do not stand alone. Rather, [**29] they are part of "a fully integrated written instrument," *Markman*, 52 F.3d at 978, consisting principally of a specification that concludes with the claims. For that reason, claims "must be read in view of the specification, of which they are a part." *Id.* at 979. As we stated in *Vitronics*, the specification "is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term." 90 F.3d at 1582.

This court and its predecessors have long emphasized the importance of the specification in claim construction. In *Autogiro Co. of America v. United States*, 181 Ct. Cl. 55, 384 F.2d 391, 397-98 (Ct. Cl. 1967), the Court of Claims characterized the specification as "a concordance for the claims," based on the statutory requirement that the specification "describe the manner and process of making and using" the patented invention. The Court of Customs and Patent Appeals made a similar point. See *In re Fout*, 675 F.2d 297, 300 (CCPA 1982) ("Claims must always be read in light of the specification. Here, the specification makes plain [**30] what the appellants did and did not invent . . .").

Shortly after the creation of this court, Judge Rich wrote that "the descriptive part of the specification aids in ascertaining the scope and meaning of the claims

inasmuch as the words of the claims must be based on the description. The specification is, thus, the primary basis for construing the claims." *Standard Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 452 (Fed. Cir. 1985). On numerous occasions since then, we have reaffirmed that point, stating that "the best source for understanding a technical term is the specification from which it arose, informed, as needed, by the prosecution history." *Multiform Dessicants*, 133 F.3d at 1478; *Metabolite Labs., Inc. v. Lab. Corp. of Am. Holdings*, 370 F.3d 1354, 1360 (Fed. Cir. 2004) ("In most cases, the best source for discerning the proper context of claim terms is the patent specification wherein the patent applicant describes the invention."); see also, e.g., *Kinik Co. v. ITC*, 362 F.3d 1359, 1365 (Fed. Cir. 2004) ("The words of patent claims have the meaning and scope with which they are used in the specification [*31] and the prosecution history."); *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1315 (Fed. Cir. 2003) ("The best indicator of claim meaning is its usage in context as understood by one of skill in the art at the time of invention.").

That principle has a long pedigree in Supreme Court decisions as well. See *Hogg v. Emerson*, 47 U.S. (6 How.) 437, 482, 12 L. Ed. 505 (1848) (the specification is a "component part of the patent" and "is as much to be considered with the [letters patent] in construing them, as any paper referred to in a deed or other contract"); *Bates v. Coe*, 98 U.S. 31, 38, 25 L. Ed. 68, 1879 Dec. Comm'r Pat. 365 (1878) ("in case of doubt or ambiguity it is proper in all cases to refer back to the descriptive portions of the specification to aid in solving the doubt or in ascertaining the true intent and meaning of the language employed in the claims"); *White v. Dunbar*, 119 U.S. 47, 51, 30 L. Ed. 303, 7 S. Ct. 72, 1886 Dec. Comm'r Pat. 494 (1886) (specification is appropriately resorted to "for the purpose of better understanding the meaning of the claim"); [*1316] *Schriber-Schroth Co. v. Cleveland Trust Co.*, 311 U.S. 211, 217, 85 L. Ed. 132, 61 S. Ct. 235, 1941 Dec. Comm'r Pat. 802 (1940) [*32] ("The claims of a patent are always to be read or interpreted in light of its specifications."); *United States v. Adams*, 383 U.S. 39, 49, 15 L. Ed. 2d 572, 86 S. Ct. 708, 174 Ct. Cl. 1293 (1966) ("It is fundamental that claims are to be construed in the light of the specifications and both are to be read with a view to ascertaining the invention.").

The importance of the specification in claim construction derives from its statutory role. The close

kinship between the written description and the claims is enforced by the statutory requirement that the specification describe the claimed invention in "full, clear, concise, and exact terms." 35 U.S.C. § 112, para. 1; see *Netword, LLC v. Centraal Corp.*, 242 F.3d 1347, 1352 (Fed. Cir. 2001) ("The claims are directed to the invention that is described in the specification; they do not have meaning removed from the context from which they arose."); see also *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 389, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996) ("[A claim] term can be defined only in a way that comports with the instrument as a whole."). In light of the statutory directive that the inventor provide [*33] a "full" and "exact" description of the claimed invention, the specification necessarily informs the proper construction of the claims. See *Merck & Co. v. Teva Pharms. USA, Inc.*, 347 F.3d 1367, 1371 (Fed. Cir. 2003) ("A fundamental rule of claim construction is that terms in a patent document are construed with the meaning with which they are presented in the patent document. Thus claims must be construed so as to be consistent with the specification, of which they are a part.") (citations omitted). In *Renishaw*, this court summarized that point succinctly:

Ultimately, the interpretation to be given a term can only be determined and confirmed with a full understanding of what the inventors actually invented and intended to envelop with the claim. The construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction.

158 F.3d at 1250 (citations omitted).

Consistent with that general principle, our cases recognize that the specification may reveal a special definition given to a claim term by the patentee that differs from the meaning [*34] it would otherwise possess. In such cases, the inventor's lexicography governs. See *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). In other cases, the specification may reveal an intentional disclaimer, or disavowal, of claim scope by the inventor. In that instance as well, the inventor has dictated the correct claim scope, and the inventor's intention, as expressed in the specification, is regarded as dispositive. See *SciMed*

Life Sys., Inc. v. Advanced Cardiovascular Sys., Inc., 242 F.3d 1337, 1343-44 (Fed. Cir. 2001).

The pertinence of the specification to claim construction is reinforced by the manner in which a patent is issued. The Patent and Trademark Office ("PTO") determines the scope of claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction "in light of the specification as it would be interpreted by one of ordinary skill in the art." *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004). Indeed, the rules of the PTO require that application claims must "conform to the invention as set forth [*35] in the remainder of the specification and the terms and phrases used in the claims must find clear support or antecedent basis in the description [*1317] so that the meaning of the terms in the claims may be ascertainable by reference to the description." 37 C.F.R. § 1.75(d)(1). It is therefore entirely appropriate for a court, when conducting claim construction, to rely heavily on the written description for guidance as to the meaning of the claims.

3

In addition to consulting the specification, we have held that a court "should also consider the patent's prosecution history, if it is in evidence." *Markman*, 52 F.3d at 980; see also *Graham v. John Deere Co.*, 383 U.S. 1, 33, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966) ("An invention is construed not only in the light of the claims, but also with reference to the file wrapper or prosecution history in the Patent Office."). The prosecution history, which we have designated as part of the "intrinsic evidence," consists of the complete record of the proceedings before the PTO and includes the prior art cited during the examination of the patent. *Autogiro*, 384 F.2d at 399. Like the specification, [*36] the prosecution history provides evidence of how the PTO and the inventor understood the patent. See *Lemelson v. Gen. Mills, Inc.*, 968 F.2d 1202, 1206 (Fed. Cir. 1992). Furthermore, like the specification, the prosecution history was created by the patentee in attempting to explain and obtain the patent. Yet because the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes. See *Inverness Med. Switz. GmbH v. Warner*

Lambert Co., 309 F.3d 1373, 1380-82 (Fed. Cir. 2002) (the ambiguity of the prosecution history made it less relevant to claim construction); *Athletic Alternatives, Inc. v. Prince Mfg., Inc.*, 73 F.3d 1573, 1580 (Fed. Cir. 1996) (the ambiguity of the prosecution history made it "unhelpful as an interpretive resource" for claim construction). Nonetheless, the prosecution history can often inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the [*37] course of prosecution, making the claim scope narrower than it would otherwise be. *Vitronics*, 90 F.3d at 1582-83; see also *Chimie v. PPG Indus., Inc.*, 402 F.3d 1371, 1384 (Fed. Cir. 2005) ("The purpose of consulting the prosecution history in construing a claim is to 'exclude any interpretation that was disclaimed during prosecution.'"), quoting *ZMI Corp. v. Cardiac Resuscitator Corp.*, 844 F.2d 1576, 1580 (Fed. Cir. 1988); *Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576 (Fed. Cir. 1995).

C

Although we have emphasized the importance of intrinsic evidence in claim construction, we have also authorized district courts to rely on extrinsic evidence, which "consists of all evidence external to the patent and prosecution history, including expert and inventor testimony, dictionaries, and learned treatises." *Markman*, 52 F.3d at 980, citing *Seymour v. Osborne*, 78 U.S. (11 Wall.) 516, 546, 20 L. Ed. 33 (1870); see also *Vitronics*, 90 F.3d at 1583. However, while extrinsic evidence "can shed useful light on the relevant art," we have explained that it is "less [*38] significant than the intrinsic record in determining 'the legally operative meaning of claim language.'" *C.R. Bard, Inc. v. U.S. Surgical Corp.*, 388 F.3d 858, 862 (Fed. Cir. 2004), quoting *Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n*, 366 F.3d 1311, 1318 (Fed. Cir. 2004); see also *Astrazeneca AB v. Mutual Pharm. Co.*, 384 F.3d 1333, 1337 (Fed. Cir. 2004).

[*1318] Within the class of extrinsic evidence, the court has observed that dictionaries and treatises can be useful in claim construction. See *Renishaw*, 158 F.3d at 1250; *Rexnord*, 274 F.3d at 1344. We have especially noted the help that technical dictionaries may provide to a court "to better understand the underlying technology" and the way in which one of skill in the art might use the claim terms. *Vitronics*, 90 F.3d at 1584 n.6. Because

dictionaries, and especially technical dictionaries, endeavor to collect the accepted meanings of terms used in various fields of science and technology, those resources have been properly recognized as among the many tools that can assist the court in determining the meaning of particular terminology [*39] to those of skill in the art of the invention. See *Teleflex, Inc. v. Ficoso N. Am. Corp.*, 299 F.3d 1313, 1325 (Fed. Cir. 2002). Such evidence, we have held, may be considered if the court deems it helpful in determining "the true meaning of language used in the patent claims." *Markman*, 52 F.3d at 980.

We have also held that extrinsic evidence in the form of expert testimony can be useful to a court for a variety of purposes, such as to provide background on the technology at issue, to explain how an invention works, to ensure that the court's understanding of the technical aspects of the patent is consistent with that of a person of skill in the art, or to establish that a particular term in the patent or the prior art has a particular meaning in the pertinent field. See *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1308-09 (Fed. Cir. 1999); *Key Pharms. v. Hercon Lab. Corp.*, 161 F.3d 709, 716 (Fed. Cir. 1998). However, conclusory, unsupported assertions by experts as to the definition of a claim term are not useful to a court. Similarly, a court should discount any expert testimony "that is clearly at [*40] odds with the claim construction mandated by the claims themselves, the written description, and the prosecution history, in other words, with the written record of the patent." *Key Pharms.*, 161 F.3d at 716.

We have viewed extrinsic evidence in general as less reliable than the patent and its prosecution history in determining how to read claim terms, for several reasons. First, extrinsic evidence by definition is not part of the patent and does not have the specification's virtue of being created at the time of patent prosecution for the purpose of explaining the patent's scope and meaning. Second, while claims are construed as they would be understood by a hypothetical person of skill in the art, extrinsic publications may not be written by or for skilled artisans and therefore may not reflect the understanding of a skilled artisan in the field of the patent. Third, extrinsic evidence consisting of expert reports and testimony is generated at the time of and for the purpose of litigation and thus can suffer from bias that is not present in intrinsic evidence. The effect of that bias can be exacerbated if the expert is not one of skill in the

relevant art or if the [*41] expert's opinion is offered in a form that is not subject to cross-examination. See *Senmed, Inc. v. Richard-Allan Med. Indus., Inc.*, 888 F.2d 815, 819 n.8 (Fed. Cir. 1989). Fourth, there is a virtually unbounded universe of potential extrinsic evidence of some marginal relevance that could be brought to bear on any claim construction question. In the course of litigation, each party will naturally choose the pieces of extrinsic evidence most favorable to its cause, leaving the court with the considerable task of filtering the useful extrinsic evidence from the fluff. See *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 595, 125 L. Ed. 2d 469, 113 S. Ct. 2786 (1993) ("Expert evidence can be both powerful and quite misleading because of the difficulty in evaluating it."). Finally, [*1319] undue reliance on extrinsic evidence poses the risk that it will be used to change the meaning of claims in derogation of the "indisputable public records consisting of the claims, the specification and the prosecution history," thereby undermining the public notice function of patents. *Southwall Techs.*, 54 F.3d at 1578.

In sum, extrinsic evidence may be useful to the court, [*42] but it is unlikely to result in a reliable interpretation of patent claim scope unless considered in the context of the intrinsic evidence. Nonetheless, because extrinsic evidence can help educate the court regarding the field of the invention and can help the court determine what a person of ordinary skill in the art would understand claim terms to mean, it is permissible for the district court in its sound discretion to admit and use such evidence. In exercising that discretion, and in weighing all the evidence bearing on claim construction, the court should keep in mind the flaws inherent in each type of evidence and assess that evidence accordingly.

III

Although the principles outlined above have been articulated on numerous occasions, some of this court's cases have suggested a somewhat different approach to claim construction, in which the court has given greater emphasis to dictionary definitions of claim terms and has assigned a less prominent role to the specification and the prosecution history. The leading case in this line is *Texas Digital Systems, Inc. v. Telegenix, Inc.*, 308 F.3d 1193 (Fed. Cir. 2002).

A

In *Texas Digital*, the court noted that [*43]

"dictionaries, encyclopedias and treatises are particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms." 308 F.3d at 1202. Those texts, the court explained, are "objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art," and they "deserve no less fealty in the context of claim construction" than in any other area of law. *Id.* at 1203. The court added that because words often have multiple dictionary meanings, the intrinsic record must be consulted to determine which of the different possible dictionary meanings is most consistent with the use of the term in question by the inventor. If more than one dictionary definition is consistent with the use of the words in the intrinsic record, the court stated, "the claim terms may be construed to encompass all such consistent meanings." *Id.*

The Texas Digital court further explained that the patent's specification and prosecution history must be consulted to determine if the patentee has used "the words [of the claim] in [**44] a manner clearly inconsistent with the ordinary meaning reflected, for example, in a dictionary definition." 308 F.3d at 1204. The court identified two circumstances in which such an inconsistency may be found. First, the court stated, "the presumption in favor of a dictionary definition will be overcome where the patentee, acting as his or her own lexicographer, has clearly set forth an explicit definition of the term different from its ordinary meaning." *Id.* Second, "the presumption also will be rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." *Id.*

The Texas Digital court explained that it advanced the methodology set forth in [*1320] that opinion in an effort to combat what this court has termed "one of the cardinal sins of patent law--reading a limitation from the written description into the claims," *SciMed Life Sys.*, 242 F.3d at 1340. The court concluded that it is improper to consult "the written description and prosecution history as a threshold step in the claim construction process, before any effort is [**45] made to discern the ordinary and customary meanings attributed to the words themselves." *Texas Digital*, 308 F.3d at 1204. To do so, the court reasoned, "invites a violation of our precedent counseling against importing limitations into the claims."

Id. Summarizing its analysis, the Texas Digital court stated:

By examining relevant dictionaries, encyclopedias, and treatises to ascertain possible meanings that would have been attributed to the words of the claims by those skilled in the art, and by further utilizing the intrinsic record to select from those possible meanings the one or ones most consistent with the use of the words by the inventor, the full breadth of the limitations intended by the inventor will be more accurately determined and the improper importation of unintended limitations from the written description into the claims will be more easily avoided.

Id. at 1205.

B

Although the concern expressed by the court in *Texas Digital* was valid, the methodology it adopted placed too much reliance on extrinsic sources such as dictionaries, treatises, and encyclopedias and too little on intrinsic sources, in particular the [**46] specification and prosecution history. While the court noted that the specification must be consulted in every case, it suggested a methodology for claim interpretation in which the specification should be consulted only after a determination is made, whether based on a dictionary, treatise, or other source, as to the ordinary meaning or meanings of the claim term in dispute. Even then, recourse to the specification is limited to determining whether the specification excludes one of the meanings derived from the dictionary, whether the presumption in favor of the dictionary definition of the claim term has been overcome by "an explicit definition of the term different from its ordinary meaning," or whether the inventor "has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope." 308 F.3d at 1204. In effect, the Texas Digital approach limits the role of the specification in claim construction to serving as a check on the dictionary meaning of a claim term if the specification requires the court to conclude that fewer than all the dictionary definitions apply, or if [**47] the specification contains a

sufficiently specific alternative definition or disavowal. See, e.g., *Texas Digital*, 308 F.3d at 1202 ("unless compelled otherwise, a court will give a claim term the full range of its ordinary meaning"); *Nystrom v. TREX Co.*, 374 F.3d 1105, 1111-13 (Fed. Cir. 2004) (ascertaining the "full range" of the ordinary meaning of the term "board" through a collection of dictionary definitions, and stating that those candidate definitions should be removed from consideration only if they were "disclaimed" in the written description or prosecution history); *Inverness Med. Switz.*, 309 F.3d at 1379 (claim should be construed to encompass multiple dictionary meanings unless "the specification or prosecution history clearly demonstrates that only one of the multiple meanings was intended"). That approach, in our view, improperly restricts the role of the specification in claim construction.

Assigning such a limited role to the specification, and in particular requiring [*1321] that any definition of claim language in the specification be express, is inconsistent with our rulings that the specification is "the single best guide [**48] to the meaning of a disputed term," and that the specification "acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication." *Vitronics*, 90 F.3d at 1582; *Irdeto Access, Inc. v. Echostar Satellite Corp.*, 383 F.3d 1295, 1300 (Fed. Cir. 2004) ("Even when guidance is not provided in explicit definitional format, the specification may define claim terms by implication such that the meaning may be found in or ascertained by a reading of the patent documents.") (citations omitted); *Novartis Pharms. Corp. v. Abbott Labs.*, 375 F.3d 1328, 1334-35 (Fed. Cir. 2004) (same); *Bell Atl. Network Servs., Inc. v. Covad Communications Group, Inc.*, 262 F.3d 1258, 1268 (Fed. Cir. 2001) ("[A] claim term may be clearly redefined without an explicit statement of redefinition.").

The main problem with elevating the dictionary to such prominence is that it focuses the inquiry on the abstract meaning of words rather than on the meaning of claim terms within the context of the patent. Properly viewed, the "ordinary meaning" of a claim term is its meaning to the ordinary artisan after reading the [**49] entire patent. Yet heavy reliance on the dictionary divorced from the intrinsic evidence risks transforming the meaning of the claim term to the artisan into the meaning of the term in the abstract, out of its particular context, which is the specification. The patent system is

based on the proposition that claims cover only the invented subject matter. As the Supreme Court has stated, "it seems to us that nothing can be more just and fair, both to the patentee and the public, than that the former should understand, and correctly describe, just what he has invented, and for what he claims a patent." *Merrill v. Yeomans*, 94 U.S. at 573-74. The use of a dictionary definition can conflict with that directive because the patent applicant did not create the dictionary to describe the invention. Thus, there may be a disconnect between the patentee's responsibility to describe and claim his invention, and the dictionary editors' objective of aggregating all possible definitions for particular words.

Although the *Texas Digital* line of cases permit the dictionary definition to be narrowed in some circumstances even when there is not an explicit disclaimer or redefinition [**50] in the specification, too often that line of cases has been improperly relied upon to condone the adoption of a dictionary definition entirely divorced from the context of the written description. The problem is that if the district court starts with the broad dictionary definition in every case and fails to fully appreciate how the specification implicitly limits that definition, the error will systematically cause the construction of the claim to be unduly expansive. The risk of systematic overbreadth is greatly reduced if the court instead focuses at the outset on how the patentee used the claim term in the claims, specification, and prosecution history, rather than starting with a broad definition and whittling it down.

Dictionaries, by their nature, provide an expansive array of definitions. General dictionaries, in particular, strive to collect all uses of particular words, from the common to the obscure. By design, general dictionaries collect the definitions of a term as used not only in a particular art field, but in many different settings. In such circumstances, it is inevitable that the multiple dictionary definitions for a term will extend beyond the "construction of [**51] the patent [that] is confirmed by the avowed understanding of the patentee, expressed by him, or on his behalf, when his application [*1322] for the original patent was pending." *Goodyear Dental Vulcanite Co. v. Davis*, 102 U.S. 222, 227, 26 L. Ed. 149, 1881 Dec. Comm'r Pat. 131 (1880). Thus, the use of the dictionary may extend patent protection beyond what should properly be afforded by the inventor's patent. See *Smith v. Snow*, 294 U.S. 1, 14, 79 L. Ed. 721, 55 S. Ct. 279, 1935 Dec. Comm'r Pat. 757 (1935) ("if the claim

were fairly susceptible of two constructions, that should be adopted which will secure to the patentee his actual invention") (emphasis added). For that reason, we have stated that "a general-usage dictionary cannot overcome art-specific evidence of the meaning" of a claim term. *Vanderlande Indus. Nederland*, 366 F.3d at 1321; see also *Renishaw*, 158 F.3d at 1250, quoting *Liebscher v. Boothroyd*, 46 C.C.P.A. 701, 258 F.2d 948, 951, 1958 Dec. Comm'r Pat. 437 (CCPA 1958) ("Indiscriminate reliance on definitions found in dictionaries can often produce absurd results. . . . One need not arbitrarily pick and choose from the various accepted definitions of a word to decide which meaning [*52] was intended as the word is used in a given claim. The subject matter, the context, etc., will more often than not lead to the correct conclusion.").

Even technical dictionaries or treatises, under certain circumstances, may suffer from some of these deficiencies. There is no guarantee that a term is used in the same way in a treatise as it would be by the patentee. In fact, discrepancies between the patent and treatises are apt to be common because the patent by its nature describes something novel. See *Autogiro*, 384 F.2d at 397 ("Often the invention is novel and words do not exist to describe it. The dictionary does not always keep abreast of the inventor. It cannot.").

Moreover, different dictionaries may contain somewhat different sets of definitions for the same words. A claim should not rise or fall based upon the preferences of a particular dictionary editor, or the court's independent decision, uninformed by the specification, to rely on one dictionary rather than another. Finally, the authors of dictionaries or treatises may simplify ideas to communicate them most effectively to the public and may thus choose a meaning that is not pertinent to the understanding [*53] of particular claim language. See generally *Ellen P. Aprill, The Law of the Word: Dictionary Shopping in the Supreme Court*, 30 *Ariz. St. L.J.* 275, 293-314 (1998). The resulting definitions therefore do not necessarily reflect the inventor's goal of distinctly setting forth his invention as a person of ordinary skill in that particular art would understand it.

As we have noted above, however, we do not intend to preclude the appropriate use of dictionaries. Dictionaries or comparable sources are often useful to assist in understanding the commonly understood meaning of words and have been used both by our court

and the Supreme Court in claim interpretation. See *Exhibit Supply Co. v. Ace Patents Corp.*, 315 U.S. 126, 134, 86 L. Ed. 736, 62 S. Ct. 513, 1942 Dec. Comm'r Pat. 738 (1942) (relying on dictionaries to construe the claim term "embedded"); *Weber Elec. Co. v. E.H. Freeman Elec. Co.*, 256 U.S. 668, 678, 65 L. Ed. 1162, 41 S. Ct. 600, 1921 Dec. Comm'r Pat. 363 (1921) (approving circuit court's use of dictionary definitions to define claim terms); *Renishaw*, 158 F.3d at 1247-53 (approving the use of dictionaries with proper respect for the role of intrinsic evidence). A dictionary definition has [*54] the value of being an unbiased source "accessible to the public in advance of litigation." *Vitronics*, 90 F.3d at 1585. As we said in *Vitronics*, judges are free to consult dictionaries and technical treatises

at any time in order to better understand the underlying technology and may also rely on dictionary definitions when construing claim terms, so long as the dictionary definition does not contradict [*1323] any definition found in or ascertained by a reading of the patent documents.

Id. at 1584 n.6.

We also acknowledge that the purpose underlying the Texas Digital line of cases--to avoid the danger of reading limitations from the specification into the claim--is sound. Moreover, we recognize that the distinction between using the specification to interpret the meaning of a claim and importing limitations from the specification into the claim can be a difficult one to apply in practice. See *Comark Commun., Inc. v. Harris Corp.*, 156 F.3d 1182, 1186-87 (Fed. Cir. 1998) ("there is sometimes a fine line between reading a claim in light of the specification, and reading a limitation into the claim from the specification"). [*55] However, the line between construing terms and importing limitations can be discerned with reasonable certainty and predictability if the court's focus remains on understanding how a person of ordinary skill in the art would understand the claim terms. For instance, although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments. See, e.g., *Nazomi Communications, Inc. v. ARM Holdings, PLC*, 403 F.3d 1364, 1369 (Fed. Cir. 2005) (claims may embrace "different subject matter than is illustrated in the specific

embodiments in the specification"); Liebel-Flarsheim, 358 F.3d at 906-08; Teleflex, 299 F.3d at 1327; SRI Int'l v. Matsushita Elec. Corp. of Am., 775 F.2d 1107, 1121 (Fed. Cir. 1985). In particular, we have expressly rejected the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment. Gemstar-TV Guide, 383 F.3d at 1366. That is not just because section 112 of the Patent Act requires that the claims themselves set forth the limits of the patent grant, but also because persons of ordinary skill in the art rarely would confine their definitions of terms to the exact representations depicted in the embodiments.

To avoid importing limitations from the specification into the claims, it is important to keep in mind that the purposes of the specification are to teach and enable those of skill in the art to make and use the invention and to provide a best mode for doing so. See Spectra-Physics, Inc. v. Coherent, Inc., 827 F.2d 1524, 1533 (Fed. Cir. 1987). One of the best ways to teach a person of ordinary skill in the art how to make and use the invention is to provide an example of how to practice the invention in a particular case. Much of the time, upon reading the specification in that context, it will become clear whether the patentee is setting out specific examples of the invention to accomplish those goals, or whether the patentee instead intends for the claims and the embodiments in the specification to be strictly coextensive. See SciMed Life Sys., 242 F.3d at 1341. The manner in which the patentee uses a term within the specification and claims usually will make the distinction apparent. See *Snow v. Lake Shore & Mich. S. Ry. Co.*, 121 U.S. 617, 630, 30 L. Ed. 1004, 7 S. Ct. 1343, 1887 Dec. Comm'r Pat. 354 (1887) (it was clear from the specification that there was "nothing in the context to indicate that the patentee contemplated any alternative" embodiment to the one presented).

In the end, there will still remain some cases in which it will be hard to determine whether a person of skill in the art would understand the embodiments to define the outer limits of the claim term or merely to be exemplary in nature. While that task may present difficulties in some cases, we nonetheless believe that attempting to resolve that problem in the context of the particular patent is likely to capture the scope of the actual invention more accurately than either strictly limiting the scope of the claims to the embodiments disclosed in the specification or divorcing the claim

language from the specification.

In Vitronics, this court grappled with the same problem and set forth guidelines for reaching the correct claim construction and not imposing improper limitations on claims. 90 F.3d at 1582. The underlying goal of our decision in Vitronics was to increase the likelihood that a court will comprehend how a person of ordinary skill in the art would understand the claim terms. See *id.* at 1584. In that process, we recognized that there is no magic formula or catechism for conducting claim construction. Nor is the court barred from considering any particular sources or required to analyze sources in any specific sequence, as long as those sources are not used to contradict claim meaning that is unambiguous in light of the intrinsic evidence. See *id.* at 1583-84; *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1367 (Fed. Cir. 2003). For example, a judge who encounters a claim term while reading a patent might consult a general purpose or specialized dictionary to begin to understand the meaning of the term, before reviewing the remainder of the patent to determine how the patentee has used the term. The sequence of steps used by the judge in consulting various sources is not important; what matters is for the court to attach the appropriate weight to be assigned to those sources in light of the statutes and policies that inform patent law. Vitronics, 90 F.3d at 1582. In Vitronics, we did not attempt to provide a rigid algorithm for claim construction, but simply attempted to explain why, in general, certain types of evidence are more valuable than others. Today, we adhere to that approach and reaffirm the approach to claim construction outlined in that case, in Markman, and in Innova. We now turn to the application of those principles to the case at bar.

IV

A

The critical language of claim 1 of the '798 patent--"further means disposed inside the shell for increasing its load bearing capacity comprising internal steel baffles extending inwardly from the steel shell walls"--imposes three clear requirements with respect to the baffles. First, the baffles must be made of steel. Second, they must be part of the load-bearing means for the wall section. Third, they must be pointed inward from the walls. Both parties, stipulating to a dictionary definition, also conceded that the term "baffles" refers to objects that check, impede, or obstruct the flow of something. The intrinsic evidence confirms that a person

of skill in the art would understand that the term "baffles," as used in the '798 patent, would have that generic meaning.

The other [**60] claims of the '798 patent specify particular functions to be served by the baffles. For example, dependent claim 2 states that the baffles may be "oriented with the panel sections disposed at angles for deflecting projectiles such as bullets able to penetrate the steel plates." The inclusion of such a specific limitation on the term "baffles" in claim 2 makes it likely that the patentee did not contemplate that the term "baffles" already contained that limitation. See *Dow Chem. Co. v. United States*, 226 F.3d 1334, 1341-42 (Fed. Cir. 2000) (concluding that an independent claim should be given broader scope than a dependent claim to avoid rendering the dependent claim redundant). Independent claim 17 further supports that proposition. It states that baffles are [*1325] placed "projecting inwardly from the outer shell at angles tending to deflect projectiles that penetrate the outer shell." That limitation would be unnecessary if persons of skill in the art understood that the baffles inherently served such a function. See *TurboCare*, 264 F.3d at 1123 (claim terms should not be read to contain a limitation "where another claim restricts the invention in exactly [**61] the [same] manner"). Dependent claim 6 provides an additional requirement for the baffles, stating that "the internal baffles of both outer panel sections overlap and interlock at angles providing deflector panels extending from one end of the module to the other." If the baffles recited in claim 1 were inherently placed at specific angles, or interlocked to form an intermediate barrier, claim 6 would be redundant.

The specification further supports the conclusion that persons of ordinary skill in the art would understand the baffles recited in the '798 patent to be load-bearing objects that serve to check, impede, or obstruct flow. At several points, the specification discusses positioning the baffles so as to deflect projectiles. See '798 patent, col. 2, ll. 13-15; id., col. 5, ll. 17-19. The patent states that one advantage of the invention over the prior art is that "there have not been effective ways of dealing with these powerful impact weapons with inexpensive housing." Id., col. 3, ll. 28-30. While that statement makes clear the invention envisions baffles that serve that function, it does not imply that in order to qualify as baffles within the meaning of the [**62] claims, the internal support structures must serve the projectile-deflecting function in all the embodiments of all the claims. The specification

must teach and enable all the claims, and the section of the written description discussing the use of baffles to deflect projectiles serves that purpose for claims 2, 6, 17, and 23, which specifically claim baffles that deflect projectiles. See *In re Wright*, 999 F.2d 1557, 1561 (Fed. Cir. 1993).

The specification discusses several other purposes served by the baffles. For example, the baffles are described as providing structural support. The patent states that one way to increase load-bearing capacity is to use "at least in part inwardly directed steel baffles 15, 16." '798 patent, col. 4, ll. 14-15. The baffle 16 is described as a "strengthening triangular baffle." Id., col. 4, line 37. Importantly, Figures 4 and 6 do not show the baffles as part of an "intermediate interlocking, but not solid, internal barrier." In those figures, the baffle 16 simply provides structural support for one of the walls, as depicted below:

GET DRAWING SHEET 1 OF 3.

GET DRAWING SHEET 2 OF 3. [**63]

Other uses for the baffles are listed in the specification as well. In Figure 7, the overlapping flanges "provide for overlapping and interlocking the baffles to produce substantially an intermediate barrier wall between the opposite [wall] faces":

GET DRAWING SHEET 2 OF 3.

[*1326] '798 patent, col. 5, ll. 26-29. Those baffles thus create small compartments that can be filled with either sound and thermal insulation or rock and gravel to stop projectiles. Id., col. 5, ll. 29-34. By separating the interwall area in to compartments (see, e.g., compartment 55 in Figure 7), the user of the modules can choose different types of material for each compartment, so that the module can be "easily custom tailored for the specific needs of each installation." Id., col. 5, ll. 36-37. When material is placed into the wall during installation, the baffles obstruct the flow of material from one compartment to another so that this "custom tailoring" is possible.

The fact that the written description of the '798 patent sets forth multiple [*1327] objectives to be served by the baffles recited in the claims confirms that the term "baffles" should [**64] not be read restrictively to require that the baffles in each case serve all of the

recited functions. We have held that "the fact that a patent asserts that an invention achieves several objectives does not require that each of the claims be construed as limited to structures that are capable of achieving all of the objectives." *Liebel-Flarsheim*, 358 F.3d at 908; see also *Resonate Inc. v. Alteon Websystems, Inc.*, 338 F.3d 1360, 1367 (Fed. Cir. 2003). Although deflecting projectiles is one of the advantages of the baffles of the '798 patent, the patent does not require that the inward extending structures always be capable of performing that function. Accordingly, we conclude that a person of skill in the art would not interpret the disclosure and claims of the '798 patent to mean that a structure extending inward from one of the wall faces is a "baffle" if it is at an acute or obtuse angle, but is not a "baffle" if it is disposed at a right angle.

B

Invoking the principle that "claims should be so construed, if possible, as to sustain their validity," *Rhine v. Casio, Inc.*, 183 F.3d 1342, 1345 (Fed. Cir. 1999), argues that the term [**65] "baffles" should be given a restrictive meaning because if the term is not construed restrictively, the asserted claims would be invalid.

While we have acknowledged the maxim that claims should be construed to preserve their validity, we have not applied that principle broadly, and we have certainly not endorsed a regime in which validity analysis is a regular component of claim construction. See *Nazomi Communications*, 403 F.3d at 1368-69. Instead, we have limited the maxim to cases in which "the court concludes, after applying all the available tools of claim construction, that the claim is still ambiguous." *Liebel-Flarsheim*, 358 F.3d at 911; see also *Generation II Orthotics, Inc. v. Medical Tech., Inc.*, 263 F.3d 1356, 1365 (Fed. Cir. 2001) ("Claims can only be construed to preserve their validity where the proposed claim construction is 'practicable,' is based on sound claim construction principles, and does not revise or ignore the explicit language of the claims."); *Elekta Instrument S.A. v. O.U.R. Scientific Int'l, Inc.*, 214 F.3d 1302, 1309 (Fed. Cir. 2000) ("having concluded that the amended claim is susceptible [**66] of only one reasonable construction, we cannot construe the claim differently from its plain meaning in order to preserve its validity"); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1434 (Fed. Cir. 1988) (rejecting argument that limitations should be added to claims to preserve the

validity of the claims). In such cases, we have looked to whether it is reasonable to infer that the PTO would not have issued an invalid patent, and that the ambiguity in the claim language should therefore be resolved in a manner that would preserve the patent's validity.

That is the rationale that gave rise to the maxim in the first place. In *Klein v. Russell*, 86 U.S. (19 Wall.) 433, 466, 22 L. Ed. 116 (1873), the owner of a reissued patent argued for a narrow construction of the patent, while the accused infringer argued for a broader construction. The Court noted that the law "required that the reissue should be for the same invention as the original patent." *Id.* Because the reissue, which was granted under the predecessor to 35 U.S.C. § 251, would have been improper under the broader construction, the Court "presumed [**67] the Commissioner did his duty" and did not issue an invalid patent. For that reason, among others, the Court construed the [**1328] disputed claim language in a manner that "sustained the patent and the construction claimed by the patentee," since that "can be done consistently with the language which he has employed." *Id.* The applicability of the doctrine in a particular case therefore depends on the strength of the inference that the PTO would have recognized that one claim interpretation would render the claim invalid, and that the PTO would not have issued the patent assuming that to be the proper construction of the term.

In this case, unlike in *Klein* and other cases in which the doctrine of construing claims to preserve their validity has been invoked, the claim term at issue is not ambiguous. Thus, it can be construed without the need to consider whether one possible construction would render the claim invalid while the other would not. The doctrine of construing claims to preserve their validity, a doctrine of limited utility in any event, therefore has no applicability here.

In sum, we reject AWH's arguments in favor of a restrictive definition of the term "baffles." Because [**68] we disagree with the district court's claim construction, we reverse the summary judgment of noninfringement. In light of our decision on claim construction, it is necessary to remand the infringement claims to the district court for further proceedings.

V

With respect to Mr. Phillips's allegation of misappropriation of trade secrets, we agree with the

panel's decision upholding the district court's ruling on that issue, in which the district court dismissed the trade secret claim on statute of limitations grounds. See Phillips, 363 F.3d at 1214-1216. Accordingly, based on the panel's disposition of that issue, we affirm the district court's dismissal of the trade secret claim. With respect to AWH's cross-appeal, we also agree with the panel's reasoning and its conclusion that the cross-appeal is improper. See *id.* at 1216. We therefore dismiss the cross-appeal.

VI

In our order granting rehearing en banc, we asked the parties to brief various questions, including the following: "Consistent with the Supreme Court's decision in *Markman v. Westview Instruments*, 517 U.S. 370, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996), and our en banc decision in *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998), [**69] is it appropriate for this court to accord any deference to any aspect of trial court claim construction rulings? If so, on what aspects, in what circumstances, and to what extent?" After consideration of the matter, we have decided not to address that issue at this time. We therefore leave undisturbed our prior en banc decision in *Cybor*.

Each party shall bear its own costs for this appeal.

AFFIRMED IN PART, REVERSED IN PART,
DISMISSED IN PART, and REMANDED.

CONCUR BY: LOURIE (In Part)

DISSENT BY: LOURIE (In Part); MAYER

DISSENT

LOURIE, Circuit Judge, concurring in part and dissenting in part, with whom NEWMAN, Circuit Judge, joins.

I fully join the portion of the court's opinion resolving the relative weights of specification and dictionaries in interpreting patent claims, in favor of the specification. I could elaborate more expansively on that topic, but Judge Bryson's opinion for the majority says it so well, there is little reason for me to repeat its truths. I also agree with the court that claims need not necessarily be limited to specific or preferred embodiments in the specification, although they are limited to what is

[*1329] contained in the overall disclosure of [**70] the specification.

However, I do dissent from the court's decision to reverse and remand the district court's decision. The original panel decision of this court, which implicitly decided the case based on the priorities that the en banc court has now reaffirmed, interpreted the claims in light of the specification and found that the defendant did not infringe the claims. We affirmed the district court, which had arrived at a similar conclusion. The dissent from the panel decision relied on the "dictionaries first" procedure, which the court now has decided not to follow. Thus, while the claim construction issue had to be decided by the en banc court, I see no reason for the court, having reaffirmed the principle on which the district judge and the panel originally decided the case, to send it back for further review.

The court premises its reverse-and-remand decision on the concept of claim differentiation and the reasoning that the contested term "baffle" need not fulfill all of the functions set out for it in the specification. Reasonable people can differ on those points. However, the court did not take this case en banc because the full court differed with the panel majority [**71] on those disputable criteria. It did so to resolve the claim construction issue, which it has now done so well. Having done so, I believe that it should simply affirm the district court's decision on the merits, consistently with that court's rationale and that of the panel that affirmed the district court, which it now adopts.

I will not critique in detail particular statements the majority makes in rationalizing its reversal of the district court's decision, such as "that a person of skill in the art would not interpret the disclosure and claims of the '798 patent to mean that a structure extending inward from one of the wall faces is a 'baffle' if it is at an acute or obtuse angle, but is not a 'baffle' if it is disposed at a right angle," or that "the patent does not require that the inward extending structures always be capable of performing that function [deflecting projectiles]" in order to be considered 'baffles'.

I will simply point out that the specification contains no disclosure of baffles at right angles. Moreover, as the majority correctly states, a patent specification is intended to describe one's invention, and it is essential to read a specification in order [**72] to interpret the meaning of the claims. This specification makes clear

that the "baffles" in this invention are angled. There is no reference to baffles that show them to be other than angled. The abstract refers to "bullet deflecting . . . baffles." Only angled baffles can deflect. It then mentions "internal baffles at angles for deflecting bullets." That could not be clearer. The specification then refers several times to baffles, often to figures in the drawings, all of which are to angled baffles. A compelling point is that the only numbered references to baffles (15, 16, 26, 27, 30, and 31) all show angled baffles.

The specification further states that steel panels "form the internal baffles at angles for deflecting bullets." It states that the baffles are "disposed at such angles that bullets which might penetrate the outer steel panels are deflected." It explains that if bullets "were to penetrate the outer steel wall, the baffles are disposed at angles which tend to deflect the bullets." There is no specific reference in this patent to a baffle that is not angled at other than 90.

While, as the majority states, the specification indicates that multiple objectives are achieved [**73] by the invention, none of the other objectives is dependent upon whether the baffles are at other than a 90 angle, whereas the constantly stated objective of [*1330] deflection of bullets is dependent upon such an angle.

Finally, even though claim construction is a question of law, reviewable by this court without formal deference, I do believe that we ought to lean toward affirmance of a claim construction in the absence of a strong conviction of error. I do not have such a conviction in this case, after considering the district court's opinion and the patent specification.

For these reasons, while I wholeheartedly join the majority opinion in its discussion and resolution of the "specification v. dictionaries" issue, I would affirm the decision below.

MAYER, Circuit Judge, with whom NEWMAN, Circuit Judge, joins, dissenting.

Now more than ever I am convinced of the futility, indeed the absurdity, of this court's persistence in adhering to the falsehood that claim construction is a matter of law devoid of any factual component. Because any attempt to fashion a coherent standard under this regime is pointless, as illustrated by our many failed attempts to do so, I dissent.

[**74] This court was created for the purpose of bringing consistency to the patent field. See H.R. Rep. No. 312, 97th Cong., 1st Sess. 20-23 (1981). Instead, we have taken this noble mandate, to reinvigorate the patent and introduce predictability to the field, and focused inappropriate power in this court. In our quest to elevate our importance, we have, however, disregarded our role as an appellate court; the resulting mayhem has seriously undermined the legitimacy of the process, if not the integrity of the institution.

In the name of uniformity, *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998) (en banc), held that claim construction does not involve subsidiary or underlying questions of fact and that we are, therefore, unbridled by either the expertise or efforts of the district court.¹ What we have wrought, instead, is the substitution of a black box, as it so pejoratively has been said of the jury, with the black hole of this court. Out of this void we emit "legal" pronouncements by way of "interpretive necromancy"²; these rulings resemble reality, if at all, only by chance. Regardless, and with a blind eye to the consequences, we [**75] continue to struggle under this irrational and reckless regime, trying every alternative--dictionaries first, dictionaries second, never dictionaries, etc., etc., etc.

1 The Supreme Court did not suggest in affirming *Markman v. Westview Instruments, Inc.*, 52 F.3d 967 (1995) (en banc), that claim construction is a purely legal question. 517 U.S. 370, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996). It held only that, as a policy matter, the judge, as opposed to the jury, should determine the meaning of a patent claim. See *Cybor*, 138 F.3d at 1464 (Mayer, C.J., dissenting) (explaining that "the [Supreme] Court chose not to accept our formulation of claim construction: as a pure question of law to be decided de novo in all cases on appeal").

2 See *The Holmes Group, Inc. v. Vornado Air Circulation Sys., Inc.*, 535 U.S. 826, 833, 153 L. Ed. 2d 13, 122 S. Ct. 1889 (2002).

Again today we vainly attempt to establish standards by which this court will interpret claims. But after proposing no fewer than seven questions, receiving more than thirty amici curiae briefs, and whipping the bar into a frenzy of expectation, we say nothing new, but merely restate [**76] what has become the practice over the last

ten years--that we will decide cases according to whatever mode or method results in the outcome we desire, or at least allows us a seemingly plausible way out of the case. I am not surprised by this. [*1331] Indeed, there can be no workable standards by which this court will interpret claims so long as we are blind to the factual component of the task. See *Cooter & Gell v. Hartmarx Corp.*, 496 U.S. 384, 405, 110 L. Ed. 2d 359, 110 S. Ct. 2447 (1990) ("Fact-bound resolutions cannot be made uniform through appellate review, de novo or otherwise." (quoting *Mars Steel Corp. v. Cont'l Bank N.A.*, 880 F.2d 928, 936 (7th Cir. 1989))).³

3 The question asked but not answered by the court which might have allowed it to cure its self-inflicted wound was: "Question 7. Consistent with the Supreme Court's decision in *Markman v. Westview Instruments, Inc.*, 517 U.S. 370, 134 L. Ed. 2d 577, 116 S. Ct. 1384 (1996) and our *en banc* decision in *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448 (Fed. Cir. 1998), is it appropriate for this court to accord any deference to any aspect of trial court claim construction rulings? If so, on what aspects, in what circumstances, and to what extent?"

[**77] Federal Rule of Civil Procedure 52(a) states that "findings of fact . . . shall not be set aside unless clearly erroneous, and due regard shall be given to the opportunity of the trial court to judge of the credibility of witnesses." According to the Supreme Court, this "rule means what it says"--that findings of fact, even "those described as 'ultimate facts' because they may determine the outcome of litigation," are to be reviewed deferentially on appeal.⁴ *Bose Corp. v. Consumers Union of United States*, 466 U.S. 485, 498, 80 L. Ed. 2d 502, 104 S. Ct. 1949 & 501, 80 L. Ed. 2d 502 (1984); see also *Anderson v. Bessemer City*, 470 U.S. 564, 575, 84 L. Ed. 2d 518, 105 S. Ct. 1504 (1985) ("Review of factual findings under the clearly-erroneous standard--with its deference to the trier of fact--is the rule, not the exception."); *Pullman-Standard, Div. of Pullman, Inc. v. Swint*, 456 U.S. 273, 287, 72 L. Ed. 2d 66, 102 S. Ct. 1781 (1982) ("Rule 52(a) broadly requires that findings of fact not be set aside unless clearly erroneous."); *United States v. United States Gypsum Co.*, 333 U.S. 364, 394, 92 L. Ed. 746, 68 S. Ct. 525 (1948). [*1332] Even those findings of fact based entirely on documentary evidence are entitled to deference. *Anderson*, 470 U.S. at 574 ("That [Rule 52(a)] goes on to

emphasize the special deference to be paid credibility determinations does not alter its clear command: Rule 52(a) 'does not make exceptions or purport to exclude certain categories of factual findings from the obligation of a court of appeals to accept a district court's findings unless clearly erroneous.'" (quoting *Pullman-Standard*, 456 U.S. at 287)). In short, we are obligated by Rule 52(a) to review the factual findings of the district court that underlie the determination of claim construction for clear error.

4 Because some facts are so intertwined with a constitutional standard the Supreme Court has held that de novo review is appropriate. For example, whether a defendant has acted with actual malice in a defamation suit is reviewed de novo because, among other reasons, the scope of the First Amendment is shaped and applied by reference to such factual determinations. *Bose*, 466 U.S. at 502 ("The content of the rule is not revealed simply by its literal text, but rather is given meaning through the evolutionary process of common-law adjudication."). Similarly, whether there is reasonable suspicion to conduct an investigatory stop or probable cause to perform a search under the Fourth Amendment are reviewed without deference. *Ornelas v. United States*, 517 U.S. 690, 696, 134 L. Ed. 2d 911, 116 S. Ct. 1657 (1996) (holding that the protections afforded by the Fourth Amendment are "fluid concepts that take their substantive content from the particular contexts in which the standards are being assessed"). The reasoning behind these limited exceptions surely does not apply to claim construction. While appearing from the perspective of this court's limited sphere of influence to be dreadfully important, claim construction does not implicate a constitutional value. Cf. *Bose*, 466 U.S. at 502 ("The constitutional values protected by the rule make it imperative that judges--and in some cases judges of [the Supreme] Court--make sure that it is correctly applied."). This is illustrated by the fact that the outcome of a patent case, unlike a defamation or illegal search case, has little impact on how future cases are decided or on how future parties behave. Cf. *id.* at 501 n.17 ("Regarding certain largely factual questions in some areas of the law, the stakes--in terms of impact on future cases and future conduct--are too great to entrust

them finally to the judgment of the trier of fact."). Even if claim construction did implicate a constitutional value, it, unlike the decisions underlying the First and Fourth Amendments, could readily be reduced, when distinguished from its factual underpinnings, to "a neat set of legal rules." Ornelas, 517 U.S. at 695-96 (quoting *Ill. v. Gates*, 462 U.S. 213, 232, 76 L. Ed. 2d 527, 103 S. Ct. 2317 (1983)).

[**79] While this court may persist in the delusion that claim construction is a purely legal determination, unaffected by underlying facts, it is plainly not the case. Claim construction is, or should be, made in context: a claim should be interpreted both from the perspective of one of ordinary skill in the art and in view of the state of the art at the time of invention. See *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998) ("It is the person of ordinary skill in the field of the invention through whose eyes the claims are construed."). These questions, which are critical to the correct interpretation of a claim, are inherently factual. They are hotly contested by the parties, not by resort to case law as one would expect for legal issues, but based on testimony and documentary evidence.⁵ During so called Markman "hearings," which are often longer than jury trials, parties battle over experts offering conflicting evidence regarding who qualifies as one of ordinary skill in the art; the meaning of patent terms to that person; the state of the art at the time of the invention; contradictory dictionary definitions and which would be [**80] consulted by the skilled artisan; the scope of specialized terms; the problem a patent was solving; what is related or pertinent art; whether a construction was disallowed during prosecution; how one of skill in the art would understand statements during prosecution; and on and on. In order to reconcile the parties' inconsistent submissions and arrive at a sound interpretation, the district court is required to sift through and weigh volumes of evidence. While this court treats the district court as an intake clerk, whose only role is to collect, shuffle and collate evidence, the reality, as revealed by conventional practice, is far different.

5 That most of the cases now appealed to this court are "summary judgments" is irrelevant. We have artificially renamed findings of fact as legal conclusions; the district courts have dutifully conformed to our fictional characterization, but this does not change the inherent nature of the

inquiry. Of course, if the parties do not dispute the material facts, summary judgment is appropriate.

Even if the procedures employed by the district court did not show that it is engaging in factfinding, the nature of the questions underlying [**81] claim construction illustrate that they are factual and should be reviewed in accordance with Rule 52(a). For each patent, for example, who qualifies as one of ordinary skill in the art will differ, just as the state of the art at the time of invention will differ. These subsidiary determinations are specific, multifarious and not susceptible to generalization; as such their resolution in one case will bear very little, if at all, on the resolution of subsequent cases. See *Ornelas*, 517 U.S. at 703 ("Law clarification requires generalization, and some issues lend themselves to generalization much more than others."); *Pierce v. Underwood*, 487 U.S. 552, 561-62, 101 L. Ed. 2d 490, 108 S. Ct. 2541 (1988) ("Many questions that arise in litigation are not amenable [**1333] to regulation by rule because they involve multifarious, fleeting, special, narrow facts that utterly resist generalization." (quoting *Maurice Rosenberg, Judicial Discretion of the Trial Court, Viewed from Above*, 22 *Syracuse L. Rev.* 635, 662 (1971))); *Icicle Seafoods, Inc. v. Worthington*, 475 U.S. 709, 714, 89 L. Ed. 2d 739, 106 S. Ct. 1527 (1986) (rejecting *de novo* review of factual questions, [**82] even when outcome determinative). That the determination of the meaning of a particular term in one patent will not necessarily bear on the interpretation of the same term in a subsequent patent illustrates this point; while the term is the same, the underlying factual context is different. It further proves that these questions (e.g., who qualifies as one of ordinary skill in the art and what was the state of the art at the time of invention, among others) are implicitly being determined in each case; because we refuse to acknowledge either their existence or importance, however, the manner of their resolution is never elucidated. Finally, that claim construction is dependent on underlying factual determinations has been verified by our experience, which shows that reviewing these questions *de novo* has not clarified the law, but has instead "distorted the appellate process, "causing confusion among the district courts and bar. See *Cooter*, 496 U.S. at 404 (quoting *Pierce*, 487 U.S. at 561); see also *Koon v. United States*, 518 U.S. 81, 99, 135 L. Ed. 2d 392, 116 S. Ct. 2035 (1996).

Our purely *de novo* review of claim interpretation also cannot [**83] be reconciled with the Supreme

Court's instructions regarding obviousness. While ultimately a question of law, obviousness depends on several underlying factual inquiries. *Graham v. John Deere Co.*, 383 U.S. 1, 17, 15 L. Ed. 2d 545, 86 S. Ct. 684 (1966); see also *Dennison Mfg. Co. v. Panduit Corp.*, 475 U.S. 809, 811, 89 L. Ed. 2d 817, 106 S. Ct. 1578 (1986) (holding that Rule 52(a) requires that the district court's subsidiary factual determinations should be reviewed for clear error); cf. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 336 U.S. 271, 275, 93 L. Ed. 672, 69 S. Ct. 535, 1949 Dec. Comm'r Pat. 527 (1949) (holding that validity, while ultimately a question of law, is founded on factual determinations that are entitled to deference). "Under [section] 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved." *Graham*, 383 U.S. at 17.

To a significant degree, each of these factual inquiries is also necessary to claim construction. Before beginning claim construction, "the scope and content of the prior art [should] be determined, [*84] " id., to establish context. The "differences between the prior art and the claims at issue [should] be ascertained," id., to better define what the inventor holds out as the invention. And, the foundation for both the obviousness and claim construction determinations is "the level of ordinary skill in the pertinent art." Id.; see *Multiform*, 133 F.3d at 1477. These underlying factual considerations receive the level of deference due under Rule 52(a) when considering obviousness, but they are scrutinized de novo in the claim construction context. As directed by the Supreme Court, however, it is especially important in the patent field, "where so much depends upon familiarity with specific scientific problems and principles not usually contained in the general storehouse of knowledge and experience," to give deference to the district court's findings of fact. *Graver Tank & Mfg. Co. v. Linde Air Prods. Co.*, 339 U.S. 605, 609-10, 94 L. Ed. 1097, 70 S. Ct. 854, 1950 Dec. Comm'r Pat. 597 (1950).

[*1334] While the court flails about in an attempt to solve the claim construction "conundrum," the solution to our plight is straightforward. We simply must follow the example of every other appellate [*85] court, which, regarding the vast majority of factual questions, reviews the trial court for clear error.⁶ This equilibrium did not come about as the result of chance or permissive appellate personalities, but because two centuries of

experience has shown that the trial court's factfinding ability is "unchallenged." *Salve Regina Coll. v. Russell*, 499 U.S. 225, 233, 113 L. Ed. 2d 190, 111 S. Ct. 1217 (1991); *Inwood Laboratories, Inc. v. Ives Laboratories, Inc.*, 456 U.S. 844, 856, 102 S. Ct. 2182, 72 L. Ed. 2d 606 (1982) ("Determining the weight and credibility of the evidence is the special province of the trier of fact."). Time has similarly revealed that it is more economical for the district court to find facts. *Pierce*, 487 U.S. at 560 ("Moreover, even where the district judge's full knowledge of the factual setting can be acquired by the appellate court, that acquisition will often come at unusual expense, requiring the court to undertake the unaccustomed task of reviewing the entire record . . .").

6 While jurisprudentially sound, the bar also supports this proposition, as evident by the many amici curiae briefs urging adherence to Rule 52(a).

Therefore, not only is it more efficient for the trial court to [*86] construct the record, the trial court is better, that is, more accurate, by way of both position and practice, at finding facts than appellate judges. *Anderson*, 470 U.S. at 574 ("The rationale for deference to the original finder of fact is not limited to the superiority of the trial judge's position to make determinations of credibility. The trial judge's major role is the determination of fact, and with experience on fulfilling that role comes expertise."); *Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 123, 23 L. Ed. 2d 129, 89 S. Ct. 1562 (1969). Our rejection of this fundamental premise has resulted, not surprisingly, in several serious problems, including increased litigation costs, needless consumption of judicial resources, and uncertainty, as well as diminished respect for the court and less "decisional accuracy." *Salve*, 499 U.S. at 233. We should abandon this unsound course.⁷

7 There are some scenarios where it is difficult to weed facts from law, see *Pullman-Standard*, 456 U.S. at 288, but claim construction is not one of them.

If we persist in deciding the subsidiary factual components [*87] of claim construction without deference, there is no reason why litigants should be required to parade their evidence before the district courts or for district courts to waste time and resources evaluating such evidence. It is excessive to require parties, who "have already been forced to concentrate

their energies and resources on persuading the trial judge that their account of the facts is the correct one," to "persuade three more judges at the appellate level." Anderson, 470 U.S. at 575. If the proceedings before the district court are merely a "tryout on the road," *id.* (quoting *Wainwright v. Sykes*, 433 U.S. 72, 90, 53 L. Ed. 2d 594, 97 S. Ct. 2497 (1977)), as they are under our current regimen, it is wasteful to require such proceedings at all. Instead, all patent cases could be filed in this court; we would determine whether claim construction is necessary, and, if so, the meaning of the

claims. Those few cases in which claim construction is not dispositive can be remanded to the district court for trial. In this way, we would at least eliminate the time and expense of the charade currently played out before the district court.

Eloquent words can mask [**88] much mischief. The court's opinion today is akin to [*1335] rearranging the deck chairs on the Titanic--the orchestra is playing as if nothing is amiss, but the ship is still heading for Davey Jones' locker.



LEXSEE 381 F.3D 1352

**HOME DIAGNOSTICS, INC., Plaintiff-Appellee, v. LIFESCAN, INC.,
Defendant-Appellant.**

03-1370

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

381 F.3d 1352; 2004 U.S. App. LEXIS 18387; 72 U.S.P.Q.2D (BNA) 1276

August 31, 2004, Decided

SUBSEQUENT HISTORY: Rehearing denied by, Rehearing, en banc, denied by Home Diagnostics v. Lifescan, Inc., 2004 U.S. App. LEXIS 27233 (Fed. Cir., Oct. 22, 2004)

PRIOR HISTORY: [**1] Appealed from: United States District Court for the Northern District of California. Judge James Ware.

Home Diagnostics, Inc. v. Lifescan, Inc., 2002 U.S. Dist. LEXIS 27575 (N.D. Cal., Oct. 2, 2002)

DISPOSITION: Reversed in part, vacated in part, and remanded.

COUNSEL: Barbara C. McCurdy, Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., of Washington, DC, argued for plaintiff-appellee. With her on the brief were Herbert H. Mintz and Kathleen A. Daley.

Dianne B. Elderkin, Woodcock Washburn LLP, of Philadelphia, Pennsylvania, argued for defendant-appellant. With her on the brief were Joseph Lucci, Lynn A. Malinoski and Steven D. Maslowski.

JUDGES: Before RADER, DYK, and PROST, Circuit Judges.

OPINION BY: RADER

OPINION

[*1353] RADER, *Circuit Judge*.

The United States District Court for the Northern District of California held that Home Diagnostics, Inc.'s (HDI's) Prestige blood glucose meters do not infringe LifeScan, Inc.'s (LifeScan's) patent on the use of reflectance to measure analyte concentration in a colored biological fluid. *Home Diagnostics, Inc. v. LifeScan, Inc.*, 2002 U.S. Dist. LEXIS 27575, No. 5:01-cv-20725-JW (N.D. Cal. Oct. 2, [*1354] 2002) (Claim Construction Order); *Diagnostics, Inc. v. LifeScan, Inc.*, No. C 01-20725 JW (PVT) (ADR) (N.D. Cal. Apr. 14, 2003) (Order Entering Judgment). Because the district [*2] court did not give the claim language its full scope and customary meaning, this court reverses the district court's claim construction order, vacates the order entering judgment, and remands for determination of validity and infringement.

1.

LifeScan's U.S. Patent No. 6,268,162 (the '162 patent) claims a method for determining the concentration of an analyte in colored biological fluids. '162 patent, col. 1, ll. 31-35. Thus, the claimed invention detects the concentration of glucose in whole blood, an important measure for diabetics. This technology facilitates both medical diagnosis and treatment of conditions where less than a microgram per deciliter of an analyte has clinical significance. *Id.* at col. 1, ll. 37-39.

Claim 4 of the '162 patent claims a method of measuring glucose concentration in whole blood with a reflectance-reading device. The prior art teaches a minimally automated process that requires the user to

place a drop of blood on a test strip, simultaneously start a timer, wait a specified period of time, and then blot the test strip to remove excess blood. Finally the prior art requires the patient to stop the reaction between the glucose in the blood and the [*3] chemicals on the test strip. These somewhat complex steps can cause measurement inaccuracies that could result in improper treatment. The claimed invention relieves the patient of timing the operation while blotting excess blood. Claim 4 of the '162 patent recites:

A method for measuring glucose concentration in a sample of whole blood using a reflectance-reading device which comprises the steps of:

(a) providing a test strip for placement in the reflectance reading device, the test strip having a matrix pad with a sample receiving surface and a testing surface opposite the sample-receiving surface, which matrix pad further comprises a reagent for reacting with the glucose in the blood sample and creating a change in reflectance at the testing surface indicative of the glucose concentration in the sample;

(b) applying a sample of whole blood to the sample-receiving surface and allowing at least a portion of the sample to travel to the testing surface and react with the reagent;

(c) taking a sequence of reflectance readings from the testing surface of said matrix at *specified time intervals upon detecting a predetermined drop in reflectance sufficient to indicate* [*4] *that said sample has reached said first surface; and*

(d) *upon detection of a suitably stable endpoint, calculating said glucose concentration in said sample from one of said reflectance readings, without having determined the time at which the sample was initially applied to the matrix pad.*

Id. at col. 22, 1.59 - col. 23, 1.18 (emphases added).

HDI initiated this suit by seeking a declaratory judgment that its Prestige blood glucose meters do not infringe the '162 patent either directly or under the doctrine of equivalents. LifeScan filed a counterclaim for infringement. The parties dispute the meaning of four claim terms, but the issue central to these disputes focuses on the meaning of "upon detection of a suitably stable endpoint." LifeScan construes this claim language to [*1355] mean, "when the stated reaction between glucose in the blood sample and reagents in the test strip is sufficiently complete that the glucose concentration of the sample can be calculated 'accurately,' i.e., without an error of clinical significance." HDI construes the same language as, "at the expiration of a predetermined time period."

After a *Markman* hearing, the district court interpreted [*5] claim 4 as limited to predetermined timing methods. In accordance with this understanding, the trial court construed "suitably stable endpoint" to mean "at the expiration of a predetermined time period." This claim construction effectively precluded LifeScan from seeking infringement of its '162 patent because HDI's accused infringing device does not use a predetermined timing methodology. Instead, the accused infringing device uses a rate methodology that monitors the rate at which the chemical reaction between glucose from the sample and the reagent occurs. Under the rate methodology, an endpoint is reached when the rate at which the chemical reaction is occurring falls below a certain level. In an effort to facilitate this appeal, LifeScan stipulated that it could not prove infringement given the trial court's claim construction. Accordingly, the district court entered a judgment of noninfringement for HDI and dismissed LifeScan's infringement counterclaim. The district court's order was rendered final under Federal Rule of Civil Procedure 54(b). Given this sequence of events, the procedural posture of this appeal is analogous to an appeal [*6] of summary judgment. That is, if the claim construction is in error, this court will vacate the judgment and remand the case for disposition on the merits.

LifeScan timely appeals. This court has jurisdiction under 28 U.S.C. § 1295(a)(1).

II.

This court reviews claim construction without deference. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1454 (Fed. Cir. 1998) (*en banc*). LifeScan's appeal

focuses solely on claim construction. At the center of the debate between the two parties is the claimed method of stopping the measurement period, step (d) of claim 4 of the '162 patent. LifeScan argues the district court erred by overlooking the accepted contextual meaning of the claim term and limiting claim 4 to a preferred embodiment which utilizes a predetermined timing method to determine the end of the measurement period. HDI argues that LifeScan has clearly disavowed claim scope by disclosing only predetermined timing methods.

As always, the claim language itself governs the meaning of the claim. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). This court construes the meaning of claim language [**7] according to its usage and context. *ResQNet.com, Inc. v. Lansa, Inc.*, 346 F.3d 1374, 1378 (Fed. Cir. 2003). The touchstone for discerning the usage of claim language is the understanding of those terms among artisans of ordinary skill in the relevant art at the time of invention. See *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342 (Fed. Cir. 2001). Indeed, normal rules of usage create a "heavy presumption" that claim terms carry their accustomed meaning in the relevant community at the relevant time. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) (citing *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989 (Fed. Cir. 1999)). The patent applicant may also define a claim term in the specification "in a manner inconsistent with its ordinary meaning." *Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1347 (Fed. Cir. 2003) [*1356] (citing *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313 at 1325-26 (Fed. Cir. 2002)). In other words, a patent applicant may define a term differently from its general usage in the relevant [**8] community, and thus expand or limit the scope of the term in the context of the patent claims. *Id.*

Another tool to supply proper context for claim construction is the prosecution history. As in the case of the specification, a patent applicant may define a term in prosecuting a patent. *CCS Fitness*, 288 F.3d at 1366 (a "claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term" in the specification or prosecution history). This court also acknowledges the relevance of extrinsic evidence, often presented in the form of expert testimony. *Vitronics*, 90 F.3d at 1585; *Pitney Bowes, Inc. v. Hewlett-Packard Co.*,

182 F.3d 1298, 1309 (Fed. Cir. 1999) ("Consultation of extrinsic evidence is particularly appropriate to ensure that [the court's] understanding of the technical aspects of the patent is not entirely at variance with the understanding of one skilled in the art."). Other useful references for construing disputed terms include dictionary definitions and treatises. See, e.g., *Tex. Digital Sys., Inc. v. Telegenix, Inc.*, 308 F.3d 1193, 1202 (Fed. Cir. 2002) [**9] ("Dictionaries, encyclopedias and treatises are particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms.").

As noted before, these claim construction aids inform the court's task of ascertaining the meaning of the claim terms to one of ordinary skill in the art at the time of invention. *Moba v. Diamond Automation, Inc.*, 325 F.3d 1306, 1315 (Fed. Cir. 2003) ("Moreover, as this court has repeatedly counseled, the best indicator of claim meaning is its usage in context as understood by one of skill in the art at the time of invention."); *Ferguson Beauregard v. Mega Sys., LLC*, 350 F.3d 1327, 1338 (Fed. Cir. 2003) ("The words used in the claims must be considered in context and are examined through the viewing glass of a person skilled in the art."); *Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1332 (Fed. Cir. 2001) ("It is important to bear in mind that the viewing glass through which the claims are construed is that of a person skilled in the art."); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 986 (Fed. Cir. 1995) (*en banc*) [**10] ("The focus is on the objective test of what one of ordinary skill in the art at the time of the invention would have understood the term to mean.").

In this case, this court must ascertain the meaning of the claim language "upon detection of a suitable stable endpoint." The claim language does not explicitly require a predetermined time for the reaction, but instead measures the endpoint by the stability of the reflectance. Thus, according to this language, the endpoint coincides with a suitable stability in the reflectance readings. At this stable endpoint, the method calculates the glucose concentration. The claim limitation emphasizes that the method does not require any determination of a starting point for application of the blood sample to the matrix. In sum, the claim language limits the endpoint by reference to suitable stability in the reflectance readings, not by reference to a predetermined time.

The specification contains further enlightenment on the accustomed usage of "upon detection of a suitably stable endpoint" among artisans of ordinary skill at the time of invention. In discussing the invention as a whole, the specification [*1357] states that the concentration of an [*11] analyte in a sample: "may be determined by measuring the change . . . between two or *more* points in time." *Id.* at col. 7, ll. 57-59 (emphasis added). This language shows that a "suitably stable endpoint" varies between unspecified points in time. A predetermined timing method is simply one means of determining when a "suitably stable endpoint" has been reached. In discussing a single embodiment of the invention that used a predetermined reaction time, the '162 patent specifically states: "using the preferred embodiments described herein, the endpoint is not particularly stable and must be precisely timed." *Id.* at col. 14, ll. 42-44. Thus, the specification limits its discussion of predetermined timing methods to preferred embodiments. Nevertheless, the invention as claimed permits detection of the endpoint with reference to the stability of the reflectance readings.

To overcome the presumption biasing claim construction in favor of the accustomed usage of a term in the relevant community at the relevant time, HDI must show a clear disavowal of such scope in the specification, prosecution history, or both. The district court erred by placing too much emphasis on the specification's [*12] discussion of the preferred embodiments, rather than the meaning of the claims themselves. Because the specification discussed only predetermined timing methods, the district court concluded incorrectly that the applicant had disavowed other ways to reach an endpoint. The specification describes a preferred embodiment of the '162 patent that uses a predetermined twenty second time period for blood samples with glucose concentrations below 250 mg/dl and a predetermined thirty second time period for samples with glucose concentrations between 250 mg/dl and 450 mg/dl. '162 patent, col. 14, ll. 47-49. Because the specification described no other embodiments in detail, the district court apparently interpreted the specification's silence regarding alternative embodiments as a disavowal. However, the applicant's choice to describe only a single embodiment does not mean that the patent clearly and unambiguously disavowed other embodiments. *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 907-08 (Fed. Cir. 2004).

As noted earlier, the specification's overall context shows that the endpoint "may be determined by measuring the change . . . between two or *more* points [*13] in time." *Id.* at col. 7, ll. 57-59 (emphasis added). The preferred embodiments that used the predetermined timing method simply do not limit the broader claim language. This court has previously stated that reference to a preferred embodiment does not alone undermine the customary meaning and scope of claim language. *Teleflex*, 299 F.3d at 1327. The meaning of the claim term "upon detection of a suitably stable endpoint" encompasses multiple methods for finding the proper endpoint. The patent's preferred embodiment is just that - one way of using the invention. That disclosure alone does not clearly and unambiguously disavow other ways of computing the endpoint within the scope of the claim language.

A patentee may claim an invention broadly and expect enforcement of the full scope of that language absent a clear disavowal or contrary definition in the specification. *Id.* at 1325. The history of the '162 patent illustrates that this applicant took this course. The '162 patent is part of a family of patents that includes U.S. Patent Nos. 5,049,487 (the '487 patent) and 5,843,692 (the '692 patent). These patents stem from the same initial application [*14] and contain the same or essentially the same specifications. In place of a "suitably stable [*1358] endpoint," the '487 patent claims recite a "predetermined time period." '487 patent, col. 22, l. 36. Similarly, the '692 patent claims recite a "predetermined incubation period" rather than a "suitably stable endpoint." '692 patent, col. 23, l. 22. This progression, from "predetermined time period" to "predetermined incubation period" to "suitably stable endpoint," shows that LifeScan purposefully sought in the '162 patent claim scope broader than the predetermined timing method. Absent a clear disavowal or contrary definition in the specification or the prosecution history, the patentee is entitled to the full scope of its claim language.

The prior art identified by the '162 patent gives additional reasons that an artisan of ordinary skill would not limit "upon detection of a suitably stable endpoint" to predetermined timing methods. *See Kumar v. Ovonic Battery Co.*, 351 F.3d 1364, 1368 (Fed. Cir. 2003); *see also Arthur A. Collins, Inc. v. N. Telecom, Ltd.*, 216 F.3d 1042, 1045 (Fed. Cir. 2000) ("When prior art that sheds light on the meaning of a term is cited [*15] by the patentee, it can have particular value as a guide to the

proper construction of the term, because it may indicate not only the meaning of the term to persons skilled in the art, but also that the patentee intended to adopt that meaning.").

Specifically, U.S. Patent Nos. 4,178,153 and 4,627,014 (the '153 patent and the '014 patent) show the usage of the claim terms at the time of invention. The '153 patent, entitled "Method and Apparatus for Chemical Spot Test Analysis" relates to chemical analysis of a sample with reagents on a fibrous or porous medium after a predetermined period of time. '153 patent, col. 1, ll. 46-51. The '153 patent discloses both an endpoint-seeking methodology and a predetermined-timing methodology. In disclosing an endpoint-seeking methodology, the '153 patent states that a sample can be analyzed, "by monitoring the resultant constituent manifesting reaction." *Id.* at col. 3, ll. 26-27. Alternatively, the '153 patent discloses that the analysis can utilize, "a single point measurement, i.e., with a single measurement of reaction product." *Id.* at col. 4, ll. 27-28. The '153 patent demonstrates that as early as 1979, artisans of ordinary skill [*16] in the art knew that a chemical analysis of a sample with reagents could be accomplished by either monitoring the reaction itself or by using a single measurement of the reaction product.

The '014 patent, entitled "Method and Apparatus for Determination of an Analyte and Method of Calibrating such Apparatus," reinforces this point. This prior art reference states that the measurement of an analyte can utilize "any chemical analyzer constructed to perform rate or endpoint colorimetric assays." '014 patent, col. 7, ll. 50-52.

In light of the preceding analysis, this court determines that the customary meaning in this art field of "upon detection of a suitable stable endpoint" means "when the stated reaction is sufficiently complete that the glucose concentration of the sample can be calculated without an error of clinical significance." This determination is confirmed by using the contemporary understanding of a skilled artisan to guide an inquiry into dictionary meanings. *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1477 (Fed. Cir. 1998). LifeScan offers a dictionary definition of the term "stable" as "not subject to sudden change: subject to relatively [*17] limited fluctuations." *Webster's Third New International Dictionary* 2071 (3d ed. 1986).

Alternatively, Webster's also defines "stable" as "firmly established." *Id.* The first definition conforms to the usage of "stable" by one of ordinary skill in the art as manifested [*1359] by the pertinent prior art references identified by the '162 patent.

In contrast, the alternative dictionary definition would import an additional limitation into the claim, namely that the analyte's reaction product and the reagent must be firmly established.

Thus, an examination of dictionary sources guided by the prior art references enlightens the meaning of "stable" and confirms this court's determination that the customary meaning in this art field of "upon detection of a suitable stable endpoint" means "when the stated reaction is sufficiently complete that the glucose concentration of the sample can be calculated without an error of clinical significance."

LifeScan also appeals the district court's construction of the claim terms: a) "specified time interval"; b) "upon detecting a predetermined drop in reflectance sufficient to indicate that sample reached said first surface"; and c) "calculating [*18] said glucose concentration in said sample from one of said reflectance readings." Because the district court read those terms as limited to predetermined timing methods, those claim terms as well require revision based on the full scope of the claim language as understood by those of skill in the art at the time of invention.

Specifically, the district court erred in construing "specified time interval" to mean "times set in advance" because it limited claim 4 of the '162 patent to a preferred embodiment. Claim Construction Order, 2002 U.S. Dist. LEXIS 27575 at *9. Again consulting dictionaries within the context of this field of technology at the time of invention, "interval" is "a space of time between two events or points of time." *Webster's Third New International Dictionary* at 1183. This definition does not carry any hint of predetermined time calculations or intervals. Because LifeScan does not clearly disavow this customary meaning of the claim term, "specified time interval" means "a space of time between two events." In this instance, the interval refers to the space of time between reflectance readings from the testing surface of the matrix.

The district court construed "upon detecting a predetermined [*19] drop in reflectance sufficient to

indicate that sample reached said first surface" to mean:

[A] reflectance reading taken immediately following or very soon after detecting the point in time of a drop in reflectance, the magnitude of which is determined in advance, *to be the point in time of the first breakthrough of sample to the testing surface*. At that point in time, the reflectance drop must be mostly or entirely due to wetting of the testing surface and not color from chemical reaction.

Claim Construction Order, 2002 U.S. Dist. LEXIS 27575 at *10 (emphasis added). In sum, the district court strictly limited the claim term to the "first breakthrough of sample to the testing surface." Because the district court restricted claim 4 of the '162 patent to predetermined timing methods, it limited the initiation of the measuring phase to "the *first* breakthrough." As discussed previously, this interpretation improperly limits claim 4 to a preferred embodiment and does not give the disputed claim terms their proper scope in this technology at the time of invention. Therefore, "upon detecting a predetermined drop in reflectance sufficient to indicate that sample reached said first surface" [**20] means "immediately following or very soon after detecting the point in time of a predetermined drop in reflectance, where the predetermined drop in reflectance is mostly or entirely due to wetting of the testing surface."

The district court also construed "calculating said glucose concentration in said [*1360] sample from one of said reflectance readings" to mean "calculating the amount of glucose contained per unit volume in the sample from the reflectance reading taken at the expiration of the *predetermined time period*." Claim Construction Order, 2002 U.S. Dist. LEXIS 27575 at *10 (emphasis added). This construction again improperly limited claim 4 of the '162 patent to predetermined timing methods. This court construes "calculating said glucose concentration in said sample from one of said reflectance readings" to mean "calculating the amount of glucose contained per unit volume in the sample using a reflectance reading taken when the reaction between glucose in the blood sample and the reagents in the test strip has reached a suitably stable endpoint."

III.

This court reverses the district court's claim construction order, vacates the order entering judgment, and remands the case for a determination of validity [**21] and infringement.

COSTS

Each party shall bear its own costs.

REVERSED-IN-PART, VACATED-IN-PART, and REMANDED

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